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PYCNOGONIDA

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(Text-figs. 1–75)

INTRODUCTION

THE Pycnogonida collected by the Royal Research Ships 'Discovery', 'Discovery II' and 'William Scoresby' during the years 1925–31 far exceed in number and variety those obtained by any previous Antarctic Expedition.[1] Sixty-five species are represented, all, with two exceptions, from the Western Antarctic and sub-Antarctic area. Of these, fifteen species are described as new, a proportion of one in four approximately. One genus is new and two (*Pallene* and *Nymphopsis*) are new to the area in question. Many of the specimens of *Decolopoda*, *Colossendeis* and *Ammothea* are of unusually large size. One feature of the collection is the abundance of minute forms, testifying to the excellence of the method of using fine nets in conjunction with trawl or dredge. None of the new species is of outstanding morphological or systematic interest, and the study does not add much of phylogenetic importance. It may well be that, while future expeditions will add to the number of species and to our knowledge of their geographical distribution, the present conception of the Antarctic pycnogonidan fauna (from shallow water) will not be materially altered.

My best thanks are due to Prof. Ch. Gravier, of Paris, Dr A. Burr, of Strasbourg, and Dr A. Panning, of Hamburg, who did all in their power to further my studies during brief visits to the respective museums. A number of the commoner forms in the earlier collection (1925–7) were identified by Dr W. T. Calman, F.R.S., before I began this study, but I am entirely responsible for the final determinations as well as for all the conclusions arrived at in this report. I am under particular obligations to Dr Calman for his helpful criticism and encouragement.

A number of the drawings were prepared by Miss Joyce Townend; the others are outline sketches drawn with the camera lucida.

NOTES ON OCCURRENCE AND DISTRIBUTION

A list of the Antarctic and sub-Antarctic species represented is given, together with other data, in the following table (pp. 4, 5).

As regards the numbers of individual specimens, out of a total exceeding 1800, at least 1200 belong to the single genus *Nymphon*. Of these, three-fourths belong to the two most common species *N. australe* (500 +) and *N. charcoti* (300 +); two other forms

[1] See Calman, 1915, p. 1.

List of species* from Antarctic and sub-Antarctic waters in the Discovery collection	Number† of specimens	Number of stations at which collected	Months when males carry ova or larvae	Magellan District	South Georgia	South Orkneys and Clarence Island	South Sandwich Islands	South Shetlands and further South	Bouvet Island	Previously recorded from Kerguelen, Gauss winter-quarters or Ross Sea area
Family DECOLOPODIDAE										
Decolopoda australis, Eights.	11	8	...	...	×	...	...	×	...	...
antarctica, Bouvier	7	6	...	...	×	×	...	...	...	...
Family COLOSSENDEIDAE										
Colossendeis scotti, Calman	4	2	...	...	×	...	...	...	...	R
tortipalpis, n.sp.	3	1	...	...	...	×	...	...	...	...
australis, Hodgson	10	4	...	...	...	×	×	×	...	R
frigida, Hodgson	38	13	...	×	×	...	×	×	...	R
scoresbii, n.sp.	16	5	...	×	...	...	...	...	...	...
wilsoni, Calman	1	1	...	...	...	×	...	...	...	R
glacialis, Hodgson	19	11	...	...	×	×	×	...	...	G, R
drakei, Calman	3	1	...	×	...	×	...	...	...	R
Family NYMPHONIDAE										
Pentanymphon antarcticum, Hodgson	11	4	...	...	...	×	×	×	...	G, R
Nymphon proceroides, Bouvier	34	4	...	...	...	...	...	×	...	...
tenuipes, Bouvier	7	2	...	...	...	...	...	×	...	...
hiemale, Hodgson	30	10	XII–III	...	×	×	...	...	...	R
gracillimum, Calman	1	1	...	...	×	...	...	...	...	R
subtile, Loman	7	4	VII	×	...	...	...	...	...	...
pfefferi, Loman	10	4	...	...	×	...	...	...	...	...
paucidens, n.sp.	13	5	I	...	×	...	...	...	...	...
charcoti, Bouvier	300+	14	XII–III	...	×	×	...	...	...	R
clarencei, n.sp.	7	3	II	...	×	×	...	...	...	...
sp. ? St. 181	1	1	...	...	...	...	...	×	...	...
sp. ? St. 53	1	1	...	×	...	...	...	...	...	...
australe, Hodgson	500+	16	XII–II	...	×	×	×	×	×	R
orcadense, Hodgson	100	2	II	...	...	×	...	...	...	...
articulare, Hodgson	5	1	...	...	...	×	...	...	...	...
neumayri, n.sp.	9	1	...	...	...	...	...	×	...	...
brevicaudatum, Miers	100	23	XII–I	...	×	×	...	×	...	...
biarticulatum, Hodgson	30	6	...	...	...	×	...	×	...	K, R
bouvieri, n.sp.	4	1	...	...	...	...	...	×	...	...
multidens, n.sp.	1	1	...	...	...	...	...	...	×	..
Heteronymphon kempi, g. et sp.n.	7	5	...	...	×	...	...	...	...	...
Family PHOXICHILIDAE (PALLENIDAE)										
Pallene margarita, n.sp.	70	12	...	×	×	...	...	...	...	...

Family Phoxichilidae (Pallenidae)										
Austropallene cornigera (Möbius)	25	11	...	...	×	×	×	×	...	G, R
brachyura (Bouvier)	2	2	...	...	×	...	...	×	...	R
cristata (Bouvier)	1	1	...	...	×	...	...	...	...	G
Family Phoxichilidiidae										
Pallenopsis pilosa (Hoek)	17	8	...	...	...	×	...	×	×	G, R
patagonica (Hoek)	55	21	III–IV [A]: VII [M]	×	×	×	...	×	...	R
spicata, Hodgson	1	1	...	...	...	×	...	...	...	G, R
Phoxichilidium australe, Hodgson	6	3	III	...	...	×	...	×	...	G, R
Family Endeidae										
Endeis australis (Hodgson)	1	1	III	...	...	...	...	×	...	...
Family Ammotheidae										
Ammothea striata (Möbius)	1	1	...	...	...	×	...	...	...	...
gigantea, n.sp.	3	1	III	...	...	...	×	...	...	...
tetrapora, n.sp.	6	2	VII	×	...	...	...	...	...	...
longispina, n.sp.	1	1	...	...	...	×	...	...	...	...
spinosa (Hodgson)	2	2	VII	×	...	...	...	...	...	R
minor (Hodgson)	5	5	...	...	×	...	×	×	...	R
calmani, n.sp.	1	1	...	...	...	...	...	×	...	...
stylirostris, n.sp.	2	1	...	...	...	×	...	...	...	...
sp. ? WS 216	1	1	...	×	...	...	...	...	...	...
carolinensis, Leach	5	5	...	...	×	...	...	...	...	...
clausi, Pfeffer	16	10	...	×	...	...	×	...	...	...
Achelia hoekii (Pfeffer)	3	1	...	...	...	...	...	×	...	...
intermedia, Calman	8	2	...	...	? ×	...	×	...	...	R
brucei, Calman	5	2	...	...	×	...	...	...	...	R
serratipalpis, Bouvier	8	1 (? 2)	III	...	...	...	...	×	...	...
parvula, Loman	150	2	...	×	...	...	...	...	...	...
Austroraptus polaris, Hodgson	1	1	...	...	...	×	...	...	...	G, R
praecox, Calman	2	1	...	...	×	...	...	...	...	R
juvenilis, Calman	7	5	...	...	×	...	×	×	...	R
Austrodecus glaciale, Hodgson	16	13	...	×	×	...	...	...	...	G, R
Tanystylum styligerum, Miers	14	1	...	×	...	...	...	...	...	K
pfefferi, Bouvier‡	25	4 (+ 2)‡	X–XII	×	×	...	...	...	×	...
Rhynchothorax australis, Hodgson	1	1	...	×	...	...	...	...	...	G, R
Nymphopsis denticulata, n.sp.	1	1	...	×	...	...	...	...	...	...
Family Pycnogonidae										
Pycnogonum rhinoceros, Loman	1	1	...	...	×	...	...	...	...	...
platylophum, Loman	2	2	...	×	...	...	...	...	...	...
magellanicum?, Loman§	4	1 (+ 1)§	...	×	...	...	...	...	...	...

* In addition to the species listed *Nymphon angolense*, n.sp., was represented by thirty specimens from a single station off the coast of Angola, males ovigerous in VII (July); and an immature specimen of a pelagic species of *Pallenopsis* was obtained off South Africa.

† Where the total number of specimens exceeds fifty, a rough but conservative estimate is given.

‡ Three specimens from (1) Gough Island, and (2) Tristan da Cunha have been referred, with some hesitation, to this species: a ♂ from the former locality was ovigerous in VI (June).

§ Two specimens from Gough Island are referred provisionally to this species; the ♂ was ovigerous in V (May).

are each represented by about 100 individuals, namely *N. orcadense* and *N. brevicaudatum*. The remaining species of the genus are, as a rule, represented by single specimens or by very small numbers. The family Ammotheidae is represented by over 300 specimens, but, with the exception of *Achelia parvula*, no species is represented by more than twenty-five specimens. Twenty-four species were each obtained only at a single station and all in small numbers. As against this *Nymphon brevicaudatum* occurred at twenty-three, and *Pallenopsis patagonica* at twenty-one stations.

The depths at which Pycnogonida were obtained rarely exceeded 500 and were usually between 2 and 350 m.

With regard to geographical distribution, the majority of the species were collected in the Glacial District of the Antarctic Zone[1] (Palmer Archipelago to South Georgia, the South Sandwich Islands and Bouvet Island); a considerable number occurred only in the Magellan District of the sub-Antarctic Zone, and a few species were found in both districts (see table, pp. 4, 5).

The 'Discovery' has done very extensive collecting in the neighbourhood of South Georgia, and the 'William Scoresby' concentrated on the neighbourhood of the Falkland Islands (Magellan District). Although the former is not so very far south of the latter group of islands, the pycnogonidan fauna apparently differs considerably. Of the nineteen species from the Magellan District only six[2] are also represented from South Georgia and one from the South Orkneys. One species, *Colossendeis scoresbii*, may prove to be a northern form[3] of *C. frigida*, which, though most commonly found in the Glacial District, is also present in the Magellan District (pp. 4, 5).

Of the four species collected beyond the northern limits of the sub-Antarctic Zone, two are very near to, if not identical with, sub-Antarctic forms (*Tanystylum pfefferi* and *Pycnogonum magellanicum* (?) from Gough Island and Tristan da Cunha).

Twenty-seven of the Antarctic and sub-Antarctic species have also been recorded from the Ross Sea Area, ten from Kaiser Wilhelm Land and two from the Kerguelen District (see table, pp. 4, 5). It is highly probable that the majority of these forms will prove to be circumpolar in their distribution.

The decapodous species *Pentapycnon charcoti*, collected by the 'Pourquoi-Pas?' off the South Shetlands, has not been rediscovered, although Dr S. Kemp was on the look-out for it.

Breeding season. Ovigerous or larvigerous males of sixteen species were obtained. As far as one can judge, in the absence of records covering all months of the year, the breeding season (assuming that there is a definite season) differs in Antarctic and in sub-Antarctic or Temperate waters. In the Antarctic Zone males were carrying ova or larvae from October to April, usually from December to March (table, pp. 4, 5). In the Magellan District all the ovigerous and larvigerous males were collected in July. In one

[1] See map given by Regan (1914, fig. 2, p. 25).

[2] *Nymphon orcadense* has also been recorded from South Georgia, in addition to those listed.

[3] Similarly *Nymphon biarticulatum* may prove to be a more southern form of the common *N. brevicaudatum* (p. 72).

instance only (*Pallenopsis patagonica*), ovigerous males were collected from both regions, and here also there is a difference of three months (March and April in Antarctic waters, July in the Magellan District). Antarctic specimens of *Tanystylum pfefferi* were carrying ova from October to December, while an ovigerous male referred to the same species was collected off Gough Island in June. Only a few records from South Temperate and Tropical waters are available and these are for the period May to July.

VARIATION AND SPECIFIC CHARACTERS

Dr Calman (1915, p. 6) divided the Pycnogonida into two categories distinguished as follows. "Certain genera and families present large numbers of minutely separated species, the distinguishing characters of which have at least the appearance of inconstancy; while other groups are composed of few species easily and sharply defined by characters that are relatively invariable." The first category is by far the larger, and I have found considerable variation also in two genera hitherto regarded as monotypic, namely *Pentanymphon* and *Austrodecus*. On the other hand the five species of *Ammothea* described as new each appear to be characterized by several distinctive, sharply defined features, although these also may prove to be liable to considerable variation when more material is available.

The larger genera belonging to the first category, e.g. *Colossendeis*, *Pallenopsis* and especially *Nymphon*, present, as every student of the group is well aware, many systematic difficulties and problems. Previous writers have sometimes taken considerable pains to provide keys to facilitate the task of specific determination, but no one seems to have undertaken a really comprehensive study of the specific characters. Since each succeeding collection includes some new, or apparently new, forms, the multiplication of species cannot profitably be continued until a thorough revision of each genus is first undertaken. This would necessitate, in addition to a re-examination of all the available types of known species, a study of the amount of variation within each species. Frequently the available number of individual specimens is far too small to admit of this. Some knowledge of the post-larval development would also prove most useful, but at present very little is known even in the more common forms. There is some evidence to show that, for example, the relative proportions of tarsus and propodus (often used to distinguish between closely allied species) differ considerably in young and adult specimens of certain species (*Colossendeis scoresbii* and *Pentanymphon antarcticum*).

The key to the determination of the "Longitarsal" species of the genus *Colossendeis* (p. 11) is little more than an extended and slightly modified edition of that previously given by Dr Calman (1915, pp. 10–11). That drawn up for the determination of the Antarctic species of the genus *Ammothea* (p. 95) is almost entirely new; as many of the specific characters as possible have been included in the key, which thus incorporates the results of what may be regarded as a preliminary revision of these species. Most of the forms included in this report are now, it is hoped, adequately described and figured, but many species not represented in the Discovery collections are still in need of revision.

I found it impossible to be certain of the identification of many of the numerous *Nymphon* species until I had re-examined the types of nearly every species previously recorded from the Antarctic and sub-Antarctic Zones. This revision probably constitutes the most important part of the paper. Species re-examined but not represented in the present collection have been described and figured in a separate short paper.[1] The results of this study have been condensed into a synoptic key (p. 31) to the determination of the adult males, and a table (p. 28). Many of the species are known from one or a very few specimens and several from the adult female only. Even when the known species had been re-examined, the interpretation of the results was by no means easy. The species appeared to fall into two fairly well-defined groups according to the form of the oviger in the adult male. Each main group could again be subdivided, for the most part, into smaller sections comprising 2–4 or more closely related forms, although an occasional form was apparently quite isolated. When the whole genus can be revised, the results of the present study may have to be considerably modified. I am aware that another worker might possibly have arrived at a quite different interpretation of the relationships of the species, but I hope the classification given here will prove to be a step in the right direction.

SYSTEMATIC ACCOUNT

Family DECOLOPODIDAE

Genus Decolopoda, Eights

Decolopoda australis, Eights (Fig. 73 A).

Bouvier, 1913, p. 48, *ubi bibl.*

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 1 ♂ (with Brachiopod attached).

St. MS 68. 2. iii. 25. East Cumberland Bay, South Georgia, 1·7 miles S ½ E to 8½ cables SE × E of Sappho Point, 220–247 m. Large rectangular net: 1 ♂ (colour in life—bright orange on legs; body, chelophores, palps and ovigers brown-red).

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point, to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 2 ♂♂ (1 with Brachiopod attached).

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia, from 54° 11′ 30″ S, 36° 35′ W to 54° 12′ S, 36° 29′ 30″ W, 88–273 m. Large otter trawl: 2 ♀♀.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia, from 54° 03′ S, 36° 39′ W to 54° 05′ S, 36° 36′ 30″ W, 132–148 m.; gy. M. St. Large otter trawl: 1 ♂.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m. Large otter trawl: 1 ♀ (with small patches of Polyzoa on limbs).

[1] Gordon, 1932.

St. 154. 18. i. 27. Jason Harbour to Larsen Point, South Georgia, from 2·6 miles S 84° W to 5½ cables S 26° E of Larsen Point, 60–160 m. Large otter trawl: 2 ♀♀ (smooth legs—1 with small growth of encrusting Polyzoa on oviger).

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: 1 ♀ (spiny legs).

Remarks. Bouvier (1913, p. 49) states that in the female the trunk is narrower and less discoidal than in the male. In the Discovery specimens the reverse is the case, the ratio of width across the second lateral process to length of trunk being 0·85–0·92 in the male and 0·92–1·01 in the female.

The accompanying table shows how this species differs from *D. antarctica*, Bouvier.

Table I

D. australis	*D. antarctica*
$\frac{\text{W. across 2nd lateral processes}}{\text{L. of trunk*}} = \begin{cases} 0{\cdot}85–0{\cdot}92 \text{ in } ♂ \\ 0{\cdot}92–1{\cdot}01 \text{ in } ♀ \end{cases}$	= 0·96–1·00 in ♂ and ♀ (0·88 in one ♂)
Palp 9-jointed	8–10-jointed
Shorter, thicker 1st joint to chelophore: (*a*) $\frac{\text{L. of 1st joint}}{\text{L. of trunk}} = 0{\cdot}50–0{\cdot}65$ (*b*) $\frac{\text{L. of 1st joint}}{\text{W. of 1st joint†}} = 4{\cdot}0–5{\cdot}3$	Longer, more slender (*a*) = 0·66–0·75 (*b*) = 6·0–8·0
Tibiae of 4th leg somewhat shorter: (*a*) $\frac{\text{L. of tibia 1}}{\text{L. of femur}} = 1{\cdot}0–1{\cdot}04$ (*b*) $\frac{\text{L. of tibia 2}}{\text{L. of femur}} = 1{\cdot}04–1{\cdot}13$	Tibiae, especially the 2nd, somewhat longer: (*a*) = 1·05–1·08 (*b*) = 1·22–1·33
Somewhat shorter proboscis, as a rule: $\frac{\text{L. of proboscis}}{\text{L. of trunk}} = 1{\cdot}15–1{\cdot}37$ (1·44 in 1 specimen)	Somewhat longer proboscis: = 1·38–1·54
Palm relatively short; fingers strongly arched	Palm relatively long, fingers but slightly arched
Ocular tubercle narrow, less than half width of cephalon	Ocular tubercle exceeding half width of cephalon

* To anterior end of abdomen. † Near base.

Distribution. The two species of the genus *Decolopoda* have been recorded only from the western side of the Glacial District of the Antarctic Zone. It is interesting to note that both forms appear to have nearly the same range, since both have been recorded from South Georgia and the South Orkneys, *D. australis* from the South Shetlands and the type of *D. antarctica* from Graham Land.

Decolopoda antarctica, Bouvier (Figs. 1, 73 B, C and 74 *b*).

Calman, 1920, p. 244, *ubi bibl.*

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 1 ♂ with all claws much worn (Brachiopod attached, and small groups of an encrusting Polyzoon on ventral surface).

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m. Large otter trawl: 1 ♀, with some encrusting Polyzoa and a Serpulid.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 1 ♂ (whole ventral surface covered by a sponge with wide sockets left for movement of ovigers; left chela covered by an encrusting Polyzoon and a similar growth commencing on movable finger of right chela).

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 ♀ (various encrusting Polyzoa on body and legs; pyriform mass of *Alcyonidium* on two terminal segments of right palp).

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m. Large otter trawl: 1 ♂, 1 ♀ (several encrusting Polyzoa and a sponge on ventral surface of ♀).

St. 164. 18. ii. 27. E end of Normanna Strait, South Orkneys, near Cape Hansen, Coronation Island, 24–36 m. Small beam trawl: 1 ♂ (encrusting Polyzoa and several adherent Foraminifera).

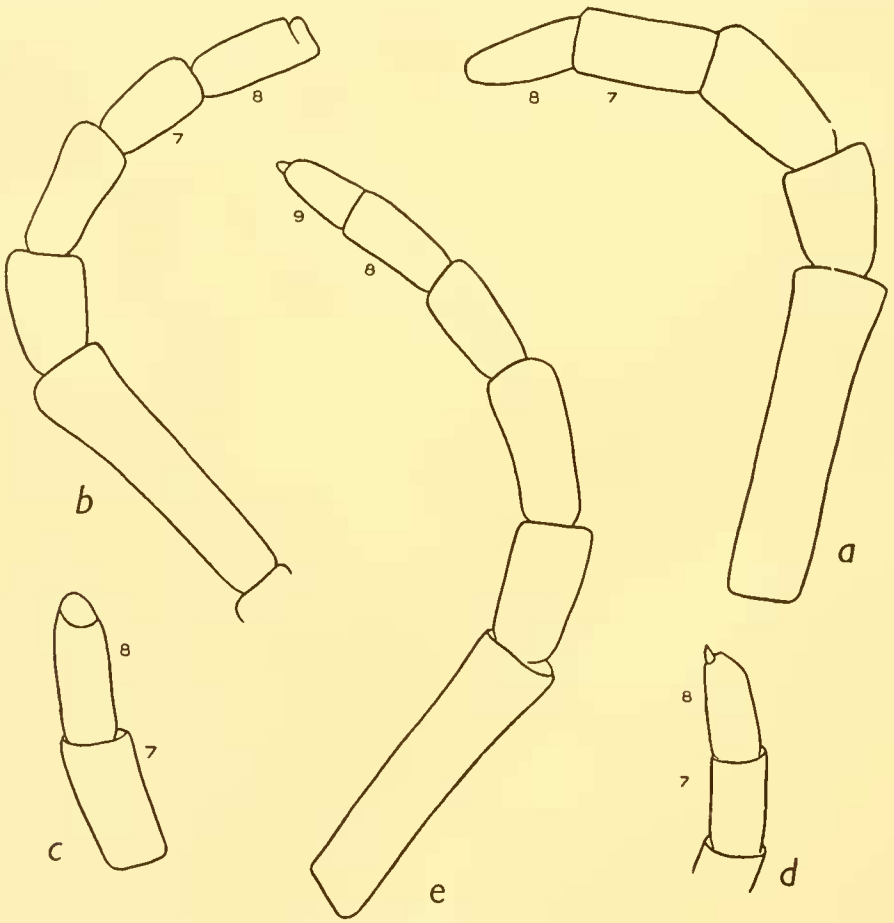

Fig. 1 *a–e*. *Decolopoda antarctica*, Bouvier. To illustrate variation in the total number of segments of the palp: × 8.

Remarks. Bouvier (1913, p. 50; 1906, pp. 27–9) has enumerated the differences between *D. australis* and the holotype of *D. antarctica*, but now that more specimens of

the latter are available, it becomes evident that certain of these differences are no longer valid.

In *D. antarctica* the number of segments in the palp is variable (8–10, see Table I, Fig. 1; Calman, 1920, p. 245, figs. A and B). This extreme variability is most unusual in Pycnogonida, where the palp has, as a rule, a constant number of segments in each species. Since it is not yet certain that this is a quite normal phenomenon, it has been dealt with under "Abnormalities" (p. 130).

According to Bouvier (1906, p. 28) the legs are considerably longer in *D. antarctica*, being approximately twelve times the maximum width of the trunk instead of only 8–9 times as in *D. australis*. In the Discovery specimens the two species are alike in this respect, for while the ratio varies from 9·3 to 12·8, the average is 10·84 for *D. australis*, 10·90 for *D. antarctica*.

In *D. antarctica* the two sexes do not differ from each other with regard to the relative width of the trunk (Table I). The chief differences between the two species are given in Table I; the outstanding characteristics of *D. antarctica* are (1) the broad ocular tubercle, (2) the slightly arched fingers, and (3) the long, slender first joint of the chelophore.

Encrusting organisms, mostly Polyzoa and sponges, are found with far greater frequency on specimens of *D. antarctica*, suggesting that it is probably of more sluggish habits than *D. australis* (see p. 132). In the male from St. 123 the left chela is rendered quite useless by a growth of Polyzoa, and in the specimen from St. 140 the ocular tubercle is partially concealed.

Distribution. See p. 4.

Family COLOSSENDEIDAE, Hoek

Genus Colossendeis, Jarzynsky

Two species are described as new, although, when more material is available, one of these may prove to be a sub-Antarctic form of a common Antarctic species. The other species is remarkable for the lateral articulation between the seventh and eighth palpal segments.

The key to the "Longitarsal" species of *Colossendeis* drawn up by Calman (1915, pp. 10–11) is reprinted below with slight modifications, chiefly those required by the incorporation of the two new species.

I. Sixth segment of palp more than three times as long as wide.

A. Proboscis distinctly longer than trunk.

I. Trunk segmented.....*C. articulata*, Loman

II. Trunk non-segmented.

A. Lateral processes in contact.

1. Seventh segment of palp longer than eighth; eyes absent...*C. proboscidea* (Sabine)

2. Seventh segment of palp shorter than eighth; eyes present.....*C. scotti*, Calman

B. Lateral processes separated.
1. Eighth segment of palp articulated laterally with seventh — *C. tortipalpis*, n.sp.
2. Eighth segment of palp normally articulated with seventh.
a. Seventh segment of palp equal to eighth — *C. australis*, Hodgson; *C. media*, Hoek; *C. brevipes*, Hoek
b. Seventh segment of palp distinctly shorter than eighth.
i. Eyes absent.
α. Proboscis dilated distally — *C. orcadensis*, Hodgson
β. Proboscis dilated in middle — *C. angusta*, Sars; *C. gracilis*, Hoek
ii. Eyes present.
α. Legs smooth — *C. megalonyx*, Hoek[1]; *C. frigida*, Hodgson
β. Legs spiny — *C. rugosa*, Hodgson

B. Proboscis subequal to trunk [claw subequal to propodus] — *C. scoresbii*, n.sp.

II. Sixth segment of palp not more than twice[2] as long as wide [proboscis, at most, hardly longer than trunk].
A. Lateral processes in contact — *C. wilsoni*, Calman
B. Lateral processes separated.
I. Femur longer than second tibia.
A. Sixth segment of palp longer than seventh, eighth or ninth — *C. glacialis*, Hodgson (*C. gracilipes*, Bouvier)
B. Sixth segment of palp subequal to seventh, but shorter than either eighth or ninth — *C. drakei*, Calman
II. Femur not longer than second tibia.
A. Lateral processes separated by their own diameter — *C. robusta*, Hoek
B. Lateral processes separated by less than their own diameter — *C. lilliei*, Calman

Colossendeis scotti, Calman.

Calman, 1915, pp. 10 and 11, fig. 1.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m; M. Large otter trawl: 1 ♂, 1 ♀.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point, to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 1 ♂, 1 ♀.

DISTRIBUTION. Previously recorded from Ross Sea.

Colossendeis tortipalpis, n.sp. (Figs. 2 *b–e*, 3 *b*, *d* and 4 *a*).

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 1 ♀ (holotype), 1 ♂ and 1 immature, soft specimen, with *C. australis*.

DIAGNOSTIC CHARACTERS. Sixth palpal segment more than three times as long as thick; eighth palpal segment articulated laterally (or termino-laterally) with seventh; proboscis as a rule exceeding 1·5 times the length of the non-segmented trunk; lateral

[1] *C. frigida*, *C. megalonyx* and *C. rugosa* may be co-specific; and *C. scoresbii* may be only a more northern form of this species.

[2] The sixth palpal segment may be rather more than twice as long as wide in *C. drakei*.

processes separated; eyes present; sub-chelate termination to tenth joint of oviger; tarsus approximately equal to, claw shorter than propodus.

Description. Greatest width of *trunk*, across the first lateral processes, just under two-thirds of its length; lateral processes separated by approximately half their own diameter. Ocular tubercle high, conical; eyes, especially the anterior pair, well developed.

Proboscis decurved, over 1·5 times as long as trunk; narrow and cylindrical for the

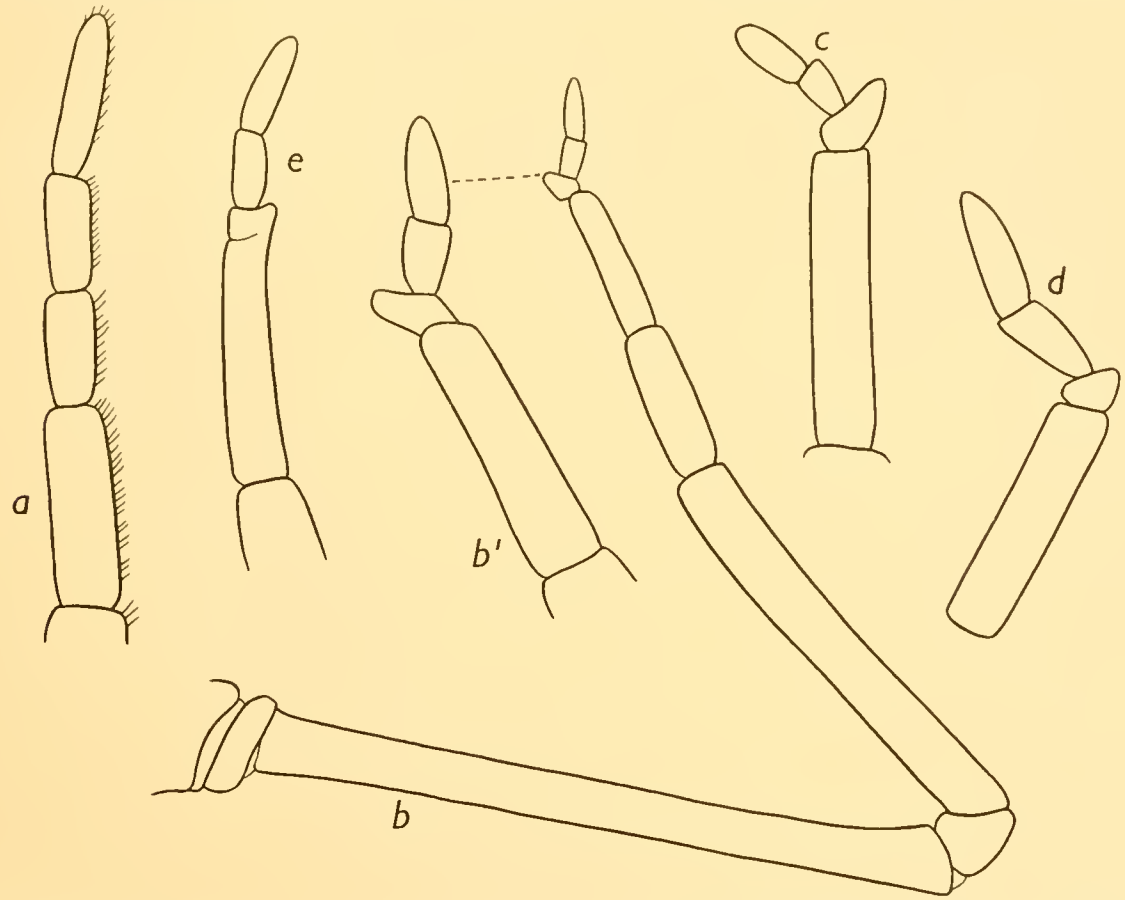

Fig. 2. Palp or four terminal palpal segments of: *a. Colossendeis australis*, Hodgson: × 11. *b–e. C. tortipalpis*, n.sp. (*b* and *c*, of male: × 11 and 20; *d*, of holotype: × 20; *e*, of immature specimen—slightly abnormal: × 17).

first third of its length, expanding to nearly twice this width in the centre, then gradually narrowing anteriorly; terminal just a little greater than basal width (Fig. 3 *d*).

Abdomen short, extending to within a short distance of the distal articulation of the first coxa; narrow and cylindrical proximally, expanding considerably at about two-thirds of its length; apex bifid.

Palp as represented in Fig. 2 *b*; length of second exceeding 1·5 times that of fourth joint; fifth and sixth joints approximately equal; eighth joint laterally articulated with seventh and somewhat shorter than the terminal one.

Oviger with fourth slightly longer than sixth segment; spines on the four terminal segments in four rows; a large curved spine at the distal end of terminal segment opposed to the claw (Fig. 4 *a*).

Legs approximately six times as long as trunk; several rows of minute spines—the median dorsal row being most conspicuous—on femur and both tibias; only an occasional spine on tarsus and propodus (Fig. 3 *b*). The species, like *C. australis*, is characterized by the presence of a semicircle of 4–8 spines placed ventrally at the distal extremity of

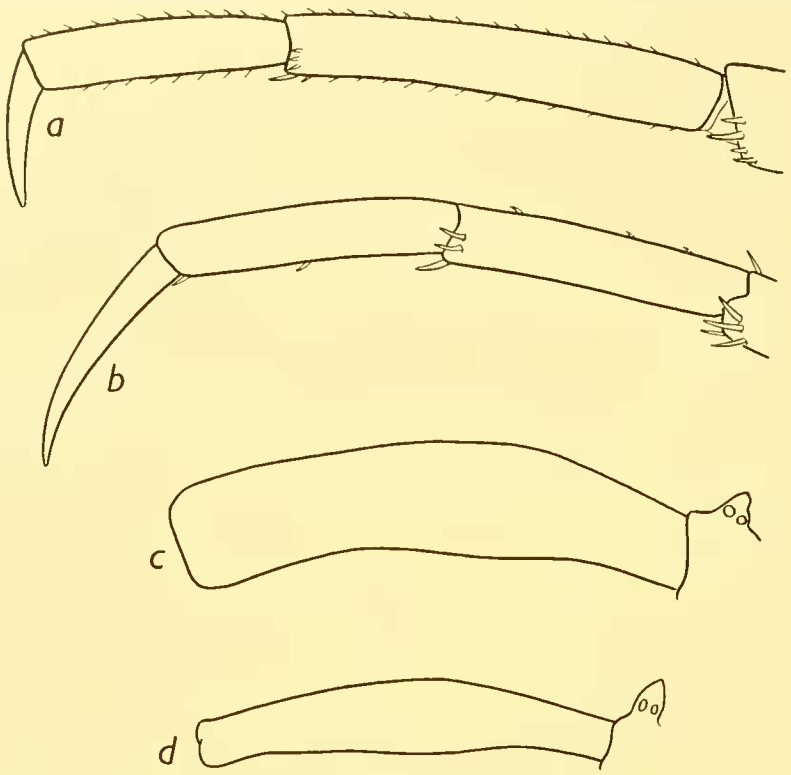

Fig. 3. *Colossendeis australis*, Hodgson: *a*. Terminal segments of third leg: × 8. *c*. Proboscis, lateral view: × 4.
Colossendeis tortipalpis, n.sp. *b*. Terminal segments of third leg: × 10. *d*. Proboscis, lateral view: × 3.

the second tibia and of the tarsus (see Fig. 3 *a* and *b*); a few smaller spines occur also at the distal articulation of the first tibia.

The genital openings of the male are not very distinct and perhaps are not yet perforate; those of the female are very conspicuous.

Measurements (*mm.*)

	Holotype ♀	♂	Immature
Length of proboscis	20·1	15·5	12·5
Greatest diameter of proboscis ...	3·7	2·7	2·0
Length of trunk	11·4	9·0	7·7
Width across first lateral process	6·9	5·7	5·0
Length of abdomen	3·1	2·5	2·0
Third leg:			
Coxa	6·5	5·3	4·5
Femur	20·0	13·6	11·0
First tibia	19·0	13·8	11·2
Second tibia	17·0	11·2	9·4
Tarsus	6·7	4·4	3·8
Propodus	6·0	4·4	3·8
Claw	5·5	3·2	3·1

Remarks. The subchelate termination of the oviger places this species near to *C. scotti*, Calman, and *C. australis*, Hodgson.[1] It resembles the latter in having the lateral processes separated, but differs from it, and from most previously described species,[2] in the lateral articulation of the eighth palpal joint. This method of articulation is apparently normal, occurring in both palps of the holotype and of the male (Fig. 2 *b*, *c* and *d*; the seventh segment is longer in both the smaller specimens than in the holotype). In the immature specimen the left palp is normal; but the right one is abnormal (Fig. 2 *e*) in that the seventh segment appears to be absent, although there is perhaps a hint of a suture near the distal extremity of the sixth joint.

C. tortipalpis differs further from *C. australis* in the following respects: (1) it is a smoother, more slender form, (2) the proboscis is more tapering and graceful (cf. Fig. 3 *c* and *d*), (3) the sub-terminal spine on last segment of oviger is more strongly developed (cf. Fig. 4 *a* and *b*), and (4) the tarsus is much shorter, while the claw is longer (cf. Fig. 3 *a* and *b*).

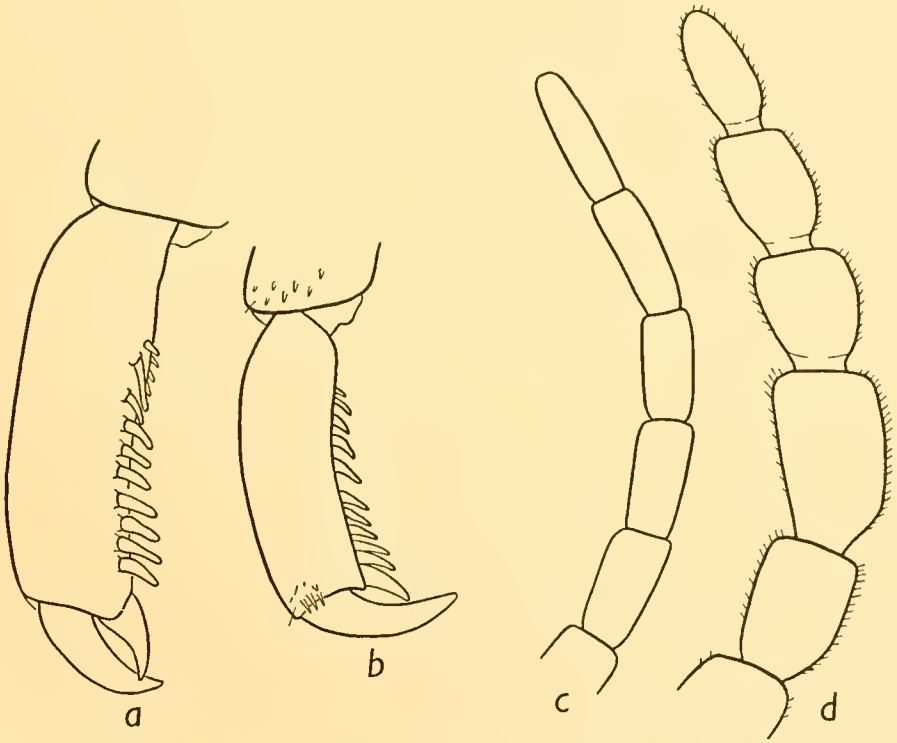

Fig. 4. Terminal segment of oviger with claw of: *a. Colossendeis tortipalpis*, n.sp.: × 36.
b. C. australis, Hodgson: × 10.
Terminal segments of palp of: *c. C. drakei*, Calman: × 20. *d. C. glacialis*, Hodgson: × 15.

Colossendeis australis, Hodgson (Figs. 2 *a*, 3 *a*, *c* and 4 *b*).

Hodgson, 1907, p. 59, pl. ix, fig. 1; pl. x, figs. 1 and 2.
Bouvier, 1913, p. 63, text-figs. 20 and 21.
Calman, 1915, pp. 10 and 14.

[1] The position that the species occupies in the key, using different characters, points to the same relationship.
[2] See Hoek, 1881, pl. ix, fig. 7, *C. gracilis*.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 7 specimens (2 soft), genital apertures very obscure.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m. Large otter trawl: 1 ♀ (very scabrous).

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 1 specimen (encrusted with Polyzoa).

St. 599. 7. i. 31. 67° 08′ S, 69° 06½′ W, 203 m. Large dredge: 1 specimen (very soft).

DISTRIBUTION. Eastern and Western Antarctic Zone.

Colossendeis frigida, Hodgson (Figs. 5 *a*, *b*, 6 *a*, *d* and 7 *c*, *d*).

Hodgson, 1907, p. 63, pl. ix, fig. 3; pl. x, figs. 5 and 6.
Calman, 1915, pp. 11 and 17.
Loman, 1923, p. 7.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 1 specimen, with *Nymphon charcoti*.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 ♂.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 1 ♂.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia, from 54° 03′ S, 36° 39′ W to 54° 05′ S, 36° 36′ 30″ W, 132–148 m.; gy. M. St. Large otter trawl: 2 ♀♀, 1 ♂ (colour of the latter, "pale horn colour throughout, with distal extremities of ovigerous legs and true legs tinged with reddish").

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 1 ♀, 1 young.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys, 60° 50′ 30″ S, 46° 15′ W, 244–344 m.; gn. M. Large otter trawl: 1 ♀, probably young.

St. 180. 11. iii. 27. 1·7 miles W of N point of Gand Island, Schollaert Channel, Palmer Archipelago, 160–330 m.; M. St. Large otter trawl: 1 specimen, probably ♀.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; M. Large otter trawl: 1 ♀, 2 ♂♂.

St. 187. 18. iii. 27. Neumayer Channel, Palmer Archipelago. 64° 48′ 30″ S, 63° 31′ 30″ W, 259 m; M. Large dredge: 4 specimens—probably 2 ♀♀, 2 ♂♂.

St. 366. 6. iii. 30. 4 cables S of Cook Island, South Sandwich Islands, 77–152 m. Large otter trawl: 15 specimens.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 2 specimens.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 3 specimens.

St. WS 248. 20. vii. 28. 52° 40′ S, 58° 30′ W, 210–242 m.; f. gn. S. Sh. Commercial otter trawl: 1 specimen.

Remarks. The specimens referred to *C. frigida*, Hodgson, are characterized as follows: (1) they are of large size and slender build (the trunk is usually 9–12 mm. long and the legs vary from nine to thirteen times the trunk length), (2) the second tibia is usually at least four-fifths of the femur, the tarsus is considerably longer and the claw shorter than the propodus (see Table II), (3) the proboscis in adult specimens is always at least half as long again as the trunk.[1]

The terminal claw of the oviger varies greatly in length (Fig. 5 *a* and *b*) and what Hodgson (1907, p. 64) terms the "thin membranous fold" is not always present.[2] The seventh palpal segment varies considerably in length, sometimes it is only as long, sometimes more than twice as long, as wide.

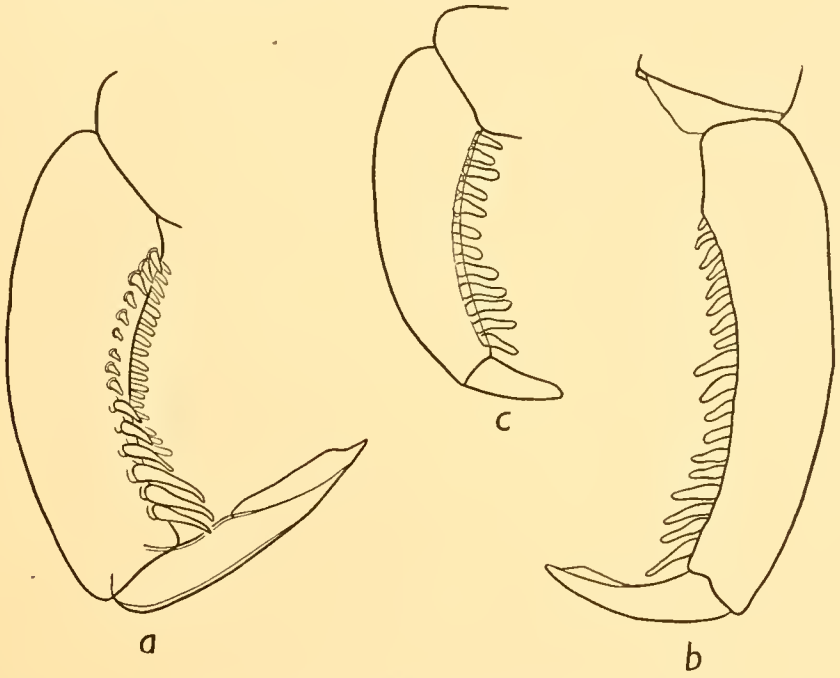

Fig. 5. Terminal segment of oviger with claw of: *a* and *b*. *Colossendeis frigida*, Hodgson: × 36. *c*. *C. scoresbii*, n.sp.: × 46.

The syntypes of *C. frigida*, from the other side of the Antarctic, are slightly more robust, with rather shorter legs (8·66–11 times the trunk length). The holotype of *C. megalonyx*, Hoek, agrees closely with the syntypes of *C. frigida* (see Table II); some of the other specimens, however, are intermediate between *C. frigida* and *C. scoresbii* (p. 21 and Table II). As suggested by Loman (1923, p. 7) *C. megalonyx*, *C. frigida* and *C. rugosa* may be co-specific, and *C. scoresbii* may prove to be just a smaller Northern form of *C. frigida* (p. 21). In that case the species would have to be called by Hoek's name—*C. megalonyx*.

[1] The proboscis was rather shorter than is typical in two small specimens of 6·8 and 7·6 mm. trunk length respectively, being 1·45 and 1·27 times the trunk.

[2] The claw may be much worn in adults where the special spines on segments 7–10 are reduced to short stumps.

Table II

	Syntypes of *C. frigida*	Syntypes of *C. rugosa*		Discovery collection		Challenger collection *C. megalonyx*			
		Length (mm.)		*C. frigida*	*C. scoresbii*	Length (mm.)			
		8·51	9·8			11·0	8·0	7·3	7·0
L. of proboscis / L. of trunk	1·75–2·03	1·59	2·14	1·57 –2·39	0·94–1·19	1·82	1·69	1·40	1·30
L. of second tibia*	8·02–9·29	7·63	8·23	7·43†–9·14	5·90–7·00	7·8	8·0	6·58	6·90
L. of tarsus*	4·68–5·03	3·29	4·62	3·92 –4·89	2·25–3·18	4·51	4·66	3·26	2·76
L. of propodus*	3·62–4·00	2·75	3·27	3·20 –3·80	2·25–3·56	3·51	3·93	2·63	2·62
L. of claw*	1·78–2·27	2·33	2·31	1·72 –2·96	3·00–4·32	3·08	3·62	2·50	2·48
L. of tarsus / L. of propodus	1·20–1·37	1·20	1·41	1·17‡–1·46	0·94–1·09	1·28	1·20	1·24	1·16
L. of claw / L. of propodus	0·49–0·58	0·85	0·71	0·54 –0·79	1·00–1·35	0·88	0·92	0·95	0·95
Distribution	Ant-arctic—Ross Sea	Antarctic—Ross Sea		Antarctic§ (S. Georgia —to Palmer Archi-pelago)	Sub-Antarctic (Magellan District)	Sub-Antarctic (Magellan District)			

* Length of femur regarded as 10.
† Usually greater than 8.
‡ Usually greater than 1·2.
§ A few sub-Antarctic (Magellan District).

Colossendeis scoresbii, n.sp. (Figs. 5 *c*, 6 *b*, *c* and 7 *a*, *b*).

C. megalonyx, Hoek, 1881, p. 67, in part.

St. WS 91. 8. iv. 27. 52° 53′ 45″ S, 64° 37′ 30″ W, 191–205 m.; f. d. S. Sh. Commercial otter trawl: 2 young specimens and 1 larva with chelophores.

St. WS 92. 8. iv. 27. 51° 58′ 30″ S, 65° 01′ W, 143–145 m.; f. d. S. St. Commercial otter trawl: 1 ♂, 1 ♀, 6 young, of which 2 are soft, and 2 larvae with chelophores.

St. WS 93. 9. iv. 27. 7 miles S, 80° W of Beaver Island, West Falkland Island, 130–133 m.; gy. S. Commercial otter trawl: 2 ♀♀.

St. WS 98. 18. iv. 27. 49° 54′ 15″ S, 60° 35′ 30″ W, 173–171 m.; f. d. S. Commercial otter trawl: 1 ♀, holotype.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 2 specimens with *C. frigida*.

Diagnostic characters. Sixth palpal segment at least three times as long as wide, seventh segment shorter than either eighth or ninth which are subequal; proboscis subequal to trunk length; lateral processes separated; eyes present; terminal claw of oviger short, less than one-third of tenth segment; tarsus subequal to, claw as a rule longer than, propodus.

Description of holotype. *Trunk* non-segmented; greatest width across first lateral processes two-thirds of its length; second and third lateral processes separated by their own diameter.

Ocular tubercle high, distal half narrow and sharply conical; anterior much larger than posterior pair of eyes.

Proboscis scarcely longer than trunk; narrow and cylindrical in proximal third, expanding in centre to 1·5 times, and again at apex to 1·25 times the proximal diameter.

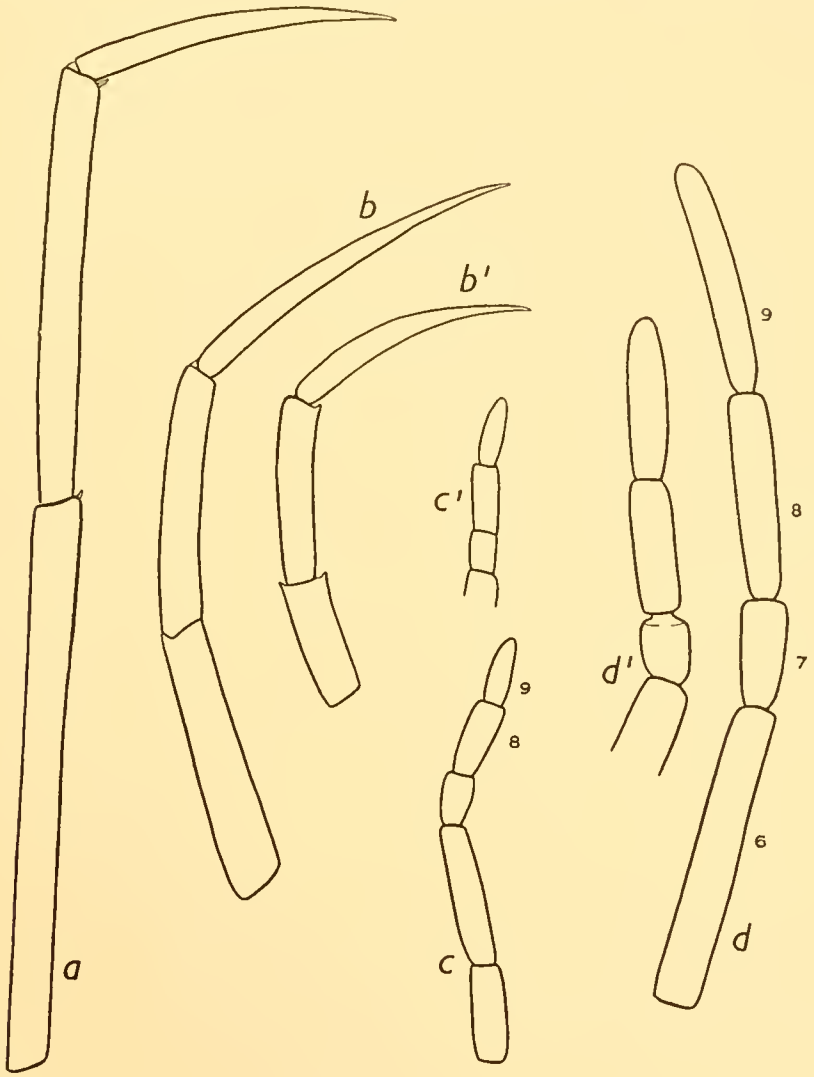

Fig. 6. *Colossendeis frigida*, Hodgson: *a*. Terminal segments of third leg of a young specimen from St. 149. *d* and *d'*. Terminal segments of palp. *C. scoresbii*, n. sp.: *b*. Terminal segments of third leg of adult from St. WS 93. *b'*. Same of chelophorous larva from St. WS 92. *c* and *c'*. Terminal segments of palp. (*a*, *b* and *b'*, × 11; *c*–*d'*, × 13.)

Abdomen reaching to distal articulation of first coxa.

Palp. Second more than half as long again as fourth segment; terminal segments as represented in Fig. 6 *c* and *c'*.

Oviger. Fourth and sixth segments subequal; seventh rather longer, tenth rather shorter than either of the two intervening segments; terminal claw short; spines

in principal row of seventh segment relatively wider than the corresponding ones in *C. frigida* (Figs. 5 *c* and 7 *a*, *b*).

Legs six or seven times as long as trunk, slender and smooth; proportions of the three longest segments 5 : 4 : 3; tarsus subequal to, claw one-third as long again as propodus (Fig. 6 *b* and Table II); genital openings conspicuous.

Larva. The chelophorous larva from WS 91 measures 7 mm. in total length (including proboscis and abdomen). The legs possess a few longish slender spines along the mid-dorsal surface of each of the three main segments. These spines are all quite long in the immature specimens accompanying the larva, but are greatly reduced in size in the holotype. The tarsus is relatively shorter[1] than in adults but the terminal claw is longer than the propodus.

The chelophore is rather shorter than the propodus, with a two-jointed scape and the palm longer than the claws. The oviger is already well developed and the palp has the full number of segments although the terminal ones are relatively shorter than in the adult. The proboscis is equal in length to the trunk and of almost uniform diameter throughout its length. The lateral processes are less widely separated than in the adult and the abdomen reaches to the middle of the second coxa.

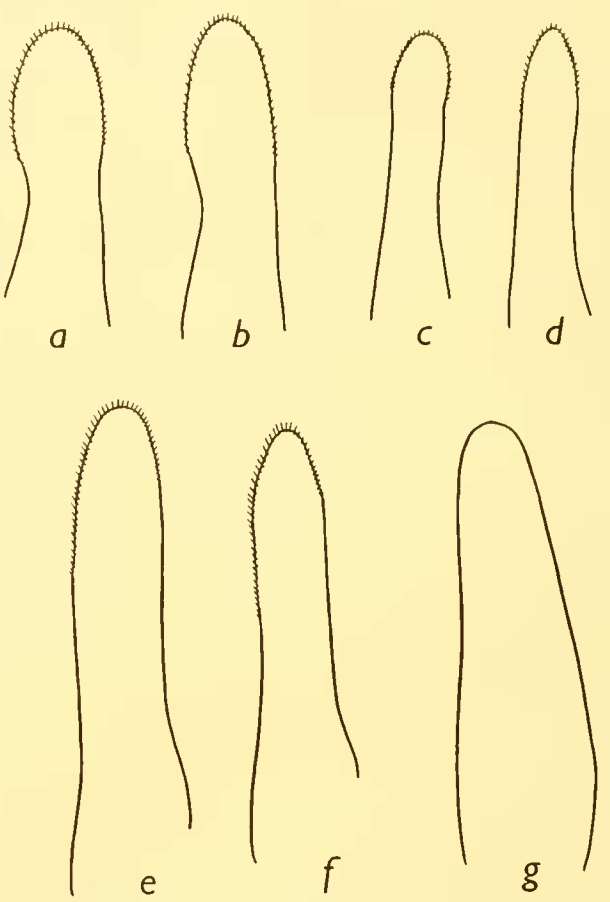

Fig. 7. Spines from principal row of seventh segment of oviger of: *a* and *b*. *Colossendeis scoresbii*, n.sp. *c* and *d*. *C. frigida*, Hodgson. *f*. *C. drakei*, Calman. *g*. *C. glacialis*, Hodgson.

e. Spine from principal row of tenth segment of oviger of *C. drakei*, Calman.

Remarks. This species rather upsets the balance of the key to the "Longitarsal" species of *Colossendeis* given by Calman (1915, p. 10), because the proboscis is subequal to the trunk as in the second group, while the sixth palpal segment is relatively long and narrow as in the first group.

The specimens referred to *C. scoresbii* are readily distinguishable from all the specimens referred to *C. frigida*, Hodgson. They are of smaller size, with shorter walking legs; the proboscis is much shorter; the spines on the four terminal segments

[1] In immature forms the tarsus is sometimes relatively short, the propodus relatively long; as growth proceeds the former elongates more rapidly than the latter segment. See also *Pentanymphon antarcticum*, p. 26.

of the oviger are broader; second tibia and tarsus are both shorter relative to the length of the femur (see Table II) and the claw is much longer.

One of the Challenger specimens referred to *C. megalonyx* by Hoek undoubtedly belongs to *C. scoresbii*. Of the remaining four specimens (Table II) two[1] are very near to, and are probably, as Loman (1923, p. 7) has suggested, identical with *C. frigida*. The other two are intermediate between *C. frigida* and *C. scoresbii* (see Table II). No intermediate forms were included in the Discovery collection, but should such forms prove to be common in the Magellan District, it may yet be necessary to unite *C. megalonyx*, *C. frigida* and *C. scoresbii*.[2] It is to be regretted that the present collection does not contain any chelophorous larvae of *C. frigida* for comparison with those of *C. scoresbii*. In the latter species the proboscis is subequal to the trunk in the larva as well as in the adult; it would be interesting to know whether in the larva of *C. frigida*, the proboscis is short or long relative to the trunk, and whether the tarsus is longer relative to the propodus than in *C. scoresbii* (Fig. 6 *b'*).

Distribution. Sub-Antarctic, north and west of Falkland Islands (Magellan District).

Colossendeis wilsoni, Calman.

Calman, 1915, pp. 11 and 18, fig. 2.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 1 ♂, with Scalpellum and ? pupa.

Remarks. This specimen agrees with the description of the holotype except in one minor point, namely that the terminal segment of the palp is as long as the preceding or seventh segment. The right palp is mutilated.

Distribution. Previously recorded from off Cape Adare.

Colossendeis glacialis, Hodgson (Figs. 4 *d*, 7 *g* and 8 *a*).

C. glacialis, Hodgson, 1907, p. 61, pl. ix, fig. 2; pl. x, figs. 3 and 4.
C. gracilipes, Bouvier, 1911, p. 1137; 1913, pp. 58–63, figs. 12–19.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 1 ♀, "pale buff with legs banded with crimson on either side of each joint".

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m; M. Large otter trawl: 1 ♂ with small patch of an encrusting Polyzoon.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia, from 54° 03′ S, 36° 39′ W to 54° 05′ S, 36° 36′ 30″ W, 132–148 m.; gy. M. St. Large otter trawl: 1 ♀ with patches of an encrusting Polyzoon on the body. The specimen is accompanied by the following note (Note 101): "'Harlequin' Pycnogon. Horn colour throughout, with scarlet red markings as follows: A few faint streaks on either side of

[1] The claw is longer, but otherwise the specimens agree with the syntypes of *C. frigida*.

[2] Two possible explanations of the relationship of the forms from the American side of the Antarctic and sub-Antarctic Zones suggest themselves. *C. frigida* and *C. scoresbii* may be northern and southern forms of one species; or there may be two distinct species which may tend to inter-breed when the southern (*C. frigida*) enters the locality of the more northern one (*C. scoresbii*).

proboscis. A spot near distal end of proximal segment of palp. A lateral stripe on abdomen between legs. Legs with dorsal patch on first 3 segments; two bands on 4th and 5th segments, one in basal and one in distal third; 6th and 7th segments except for small patch at distal end; 8th segment with proximal half red; claw horn-coloured".

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 4 specimens (2 soft), probably all ♀♀. "Harlequin" Pycnogon. Small patches of an encrusting Polyzoon on the hard specimens.

St. 155. 18. i. 27. 4·1 miles S, 26½° E of Larsen Point, South Georgia, 260 m.; M. Large otter trawl: 1 ♂ with small patches of encrusting Polyzoa on body and legs.

St. 156. 20. i. 27. 53° 51′ S, 36° 21′ 30″ W, 200–236 m.; R. Large dredge: 1 ♀.

St. 158. 21. i. 27. 53° 48′ 30″ S, 35° 57′ W, 401–411 m.; R. Large dredge: 1 ♀ "Harlequin" Pycnogon.

St. 160. 7. ii. 27. Near Shag Rocks, 53° 43′ 40″ S, 40° 57′ W, 177 m.; gy. M. St. R. Large dredge: 1 ♀ (genital apertures very prominent).

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 5 specimens, 1 with a small Lamellibranch, 1 with a very small Scalpellum, several with encrusting Polyzoa.

St. 363. 26. ii. 30. 2·5 miles S 80° E of SE point of Zavodovski Island, South Sandwich Islands, 329–278 m.; Sc. Large dredge: 2 specimens.

St. 366. 6. iii. 30. 4 cables S of Cook Island, South Sandwich Islands, 77–152 m. Large otter trawl: 1 specimen.

Remarks. The striking colour of this species in the living condition led the collectors to give it the name of "Harlequin" Pycnogon (see St. 148). Traces of the red markings are still apparent in a few of the specimens.

In small specimens, although the genital apertures are present, it is not easy to distinguish the sexes. In adult females the genital opening is situated obliquely on a round, blunt eminence that is very conspicuous in some specimens (e.g. from St. 160).

Colossendeis drakei, Calman (Figs. 4 *c*, 7 *e*, *f* and 8 *b*).

Calman, 1915, pp. 11 and 22, fig. 3.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 2 specimens, probably ♀♀, but genital apertures rather obscure.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 1 specimen.

Description. *Trunk* non-segmented, lateral processes separated by approximately their own diameter. Ocular tubercle conical; eyes, especially anterior pair, well developed.

Proboscis a trifle shorter than trunk, diameter at distal end approximately 1·5 times that at base and rather *greater* than that in the centre.

Abdomen short, reaching to middle of first coxa, considerably expanded in centre.

Palp with second slightly longer than fourth segment; fifth, sixth and seventh segments subequal and each rather shorter than eighth or ninth.

Oviger with fourth joint equal to sixth; terminal claw half as long as tenth segment; spines in principal row on each of the four distal segments relatively broader than in

C. glacialis, and serrated distally like those of *C. frigida*, *C. megalonyx* and *C. scoresbii*, n.sp. (Fig. 7 *e* and *f*).

Legs slender, without spines; claw equal to or slightly shorter than propodus which is only a little shorter than tarsus (see Fig. 8 *b*).

Surface of body and limbs destitute of spines or spinules but uniformly covered with minute setae.

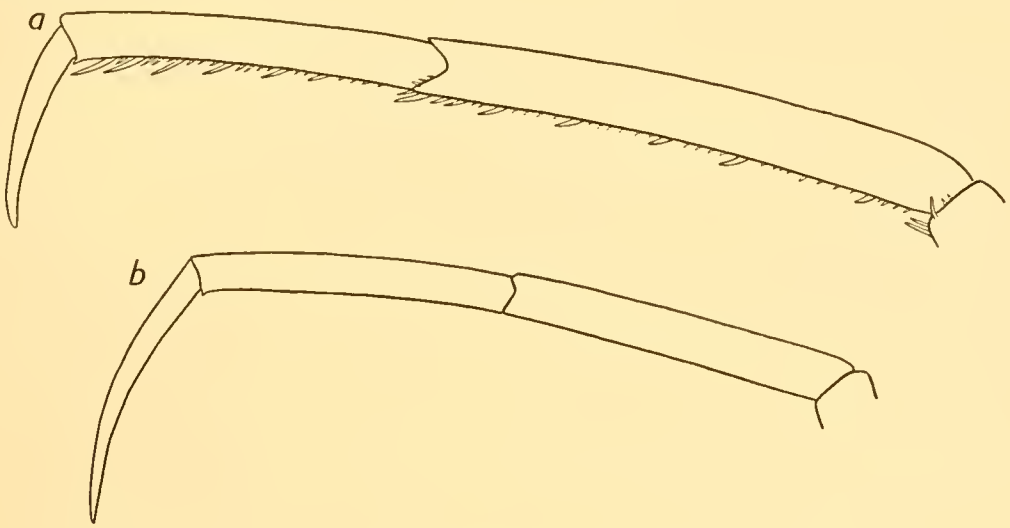

Fig. 8. Terminal segments of third leg of: *a. Colossendeis glacialis*, Hodgson, paratype. *b. C. drakei*, Calman, holotype (both × 11).

Measurements (mm.)

Length of proboscis	6·3	5·5
Greatest diameter of proboscis (at apex)	1·4	1·4
Length of trunk	6·5	6·0
Width across lateral processes	4·5	4·0
Length of abdomen	1·7	1·5
Third right leg:		
Coxa	3·8	3·6
Femur	13·0	11·0
First tibia	11·1	9·6
Second tibia	9·5	8·0
Tarsus	4·2	3·8
Propodus	4·0	3·5
Claw	3·7	3·5

Remarks. These specimens are most nearly related to *C. glacialis*, Hodgson, but differ from that species in the following respects: (1) they are of more slender build without the spinules on body and legs characteristic of *C. glacialis*, (2) the tarsus is shorter, the claw longer and there are no spines on the legs (cf. Fig. 8 *a* and *b*), (3) the terminal joints of the palp are narrower, the sixth segment is twice as long as wide, the seventh nearly as long as and the two distal ones rather longer than the sixth, the setae on the palp are much shorter (cf. Fig. 4 *c* and *d*); (4) the principal spines on the ovigers are thin, broadened and serrate distally, recalling those of *C. frigida* and *C. scoresbii* (cf. Fig. 7 *a–f* and *g*); (5) the abdomen is shorter and broader.

The specimens agree well with the types of *C. drakei*; the ocular tubercle, however, is considerably higher and more conical.

DISTRIBUTION. Previously recorded from the Ross Sea area.

Family NYMPHONIDAE

Genus **Pentanymphon**, Hodgson

Pentanymphon antarcticum, Hodgson.

Hodgson, 1904, p. 459, pl. xiv; 1907, p. 36, pl. v; 1908, p. 177.
Bouvier, 1906, p. 30, text-figs. 3–6; 1913, p. 66, text-figs. 22–24.
Calman, 1915, p. 27.
Loman, 1923, p. 9.

? St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ 00″ W, 342 m.; R. Large dredge: 1 ♂.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; M. Large otter trawl: 1 ♂.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ 00″ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: 5 specimens.

St. 366. 6. iii. 30. 4 cables S of Cook Island, South Sandwich Islands, 77–152 m. Large otter trawl: 4 specimens.

REMARKS. Previous workers have commented on the variability of this species (Bouvier, 1913; Calman, 1915). The table of measurements opposite gives some indication of the nature and extent of this variation. Two adult males, one ovigerous the other larvigerous, were chosen at random from among the syntypes and measured. In both the neck is relatively long, the cephalic segment being 2·6–2·8 times as long as wide anteriorly; the second coxa is long (1·63–1·68[1] times the sum of the first and third) and the tarsus is rather longer than the propodus. The two Terra Nova specimens measured agree well with the syntypes; the second coxa in the male is slightly longer and in both specimens the tarsus is considerably longer than in the types.

Of the specimens in the Discovery collection, those from St. 366 agree well with the syntypes (allowing for sexual differences), but the neck is rather shorter. In the adult female from St. 195 the neck is still shorter and, unusual in adults, the tarsus is shorter than the propodus. The other specimens from the latter station are not quite mature, but in each the tarsus is rather shorter than the propodus.

The male from St. 181 has a remarkably long neck so that the cephalic segment is four times as long as wide anteriorly. Also the second coxa is unusually long and slender; the tarsus is nearly half as long again as the propodus (cf. the specimens in the Terra Nova collection).

But most interesting of all is the specimen from St. 170. Although only 2·8 mm. long

[1] Approximately 1·4 in the ♀.

it is apparently an adult male, for the genital pores are quite distinct. The neck is short, and the tarsus is not quite as long as the propodus, so that in these respects it resembles the specimens from St. 195. But the second coxa is very long, as in the specimen from St. 181. Now, as a general rule, specimens of *P. antarcticum* do not appear to reach sexual maturity until they are somewhere in the neighbourhood of 6 mm. in length. The smallest syntypes examined measured 3·4–3·8 mm. in length and were obviously immature. It is very probable that the specimen from St. 170 belongs to a much smaller species than *P. antarcticum*. But until more specimens are forthcoming, and until more is known of the changes that occur during the post-larval development of *P. antarcticum*, this question must remain undecided.

Measurements (mm.)

	Syntypes		Terra Nova St. 333		Discovery collection								
					St. 181	St. 366			St. 195				St. 170
	Ovig. ♂	Lar'g. ♂	♀	Ovig. ♂	♂	♀	♀	?	♀	? ♀	? ♂	?	♂
L. of proboscis ...	2·2	1·0	3·2	2·6	2·0	2·8	3·65	2·0	2·5	2·0	1·9	0·8	1·0
Diameter of proboscis	0·67	0·6	1·07	0·75	0·7	0·95	1·15	0·7	1·0	0·8	0·5	0·35	0·5
L. of trunk	6·4	6·0	7·6	7·0	7·6	7·2	8·2	5·2	6·4	6·4	5·8	3·6	2·8
L. of cephalic segment	2·8	2·6	3·6	3·0	3·6	3·0	3·8	2·3	2·5	2·4	2·4	1·4	1·2
W. across anterior cephalic lobes	1·0	1·0	1·4	1·2	0·9	1·5	1·9	1·1	1·6	1·4	1·0	0·6	0·67
W. of neck	0·4	0·39	0·6	0·5	0·33	0·6	0·8	0·4	0·6	0·5	0·4	0·23	0·27
W. across second lateral processes	3·6	3·2	4·0	3·8	3·5	3·8	4·5	3·1	3·5	3·2	2·8	1·8	1·47
L. of abdomen ...	0·6	0·6	0·8	0·8	0·6	1·0	1·3	1·2	0·8	0·6	0·45	0·4	0·5
L. of cephalic segment / W. of cephalic lobes	2·8	2·6	2·57	2·5	4·0	2·0	2·0	2·1	1·56	1·71	2·4	2·33	1·79
W. of cephalic lobes* / W. of neck	2·5	2·56	2·33	2·4	2·73	2·5	2·38	2·75	2·66	2·8	2·5	2·61	2·49
Third leg:													
First coxa	1·0	0·93	1·2	1·0	1·0	1·2	1·4	1·0	1·0	0·9	0·8	0·45	0·5
Second coxa ...	2·6	2·6	3·0	2·8	3·2	2·8	3·2	2·0	2·4	1·6	1·8	0·9	1·5
Third coxa ...	0·6	0·6	0·93	0·6	0·6	0·7	1·0	0·6	0·8	0·6	0·6	0·3	0·2
Femur	6·0	6·4	9·6	8·0	6·8	8·0	9·4	4·6	6·6	4·6	4·6	1·8	2·9
First tibia	7·2	7·2	10·2	8·8	8·2	9·2	10·0	5·6	7·4	5·0	5·4	1·7	3·2
Second tibia ...	10·0	10·4	15·2	14·0	11·7	13·6	15·0	8·6	10·4	7·4	7·8	2·85	4·8
Tarsus	1·47	1·7	2·4	2·4	2·3	2·4	2·2	1·6	1·73	1·2	1·35	0·5	0·93
Propodus	1·33	1·4	1·6	1·73	1·6	2·0	2·0	1·6	2·0	1·6	1·4	0·8	1·0
Claw	0·6	0·6	0·7	0·7	0·7	0·8	0·9	0·62	0·8	0·6	0·5	0·3	0·25
L. of coxa 2 / L. of coxae 1 + 3 ...	1·68	1·63	1·41	1·75	2·0	1·47	1·33	1·25	1·33	1·07	1·29	1·2	2·14
L. of tarsus / L. of propodus ...	1·21	1·11	1·5	1·39	1·45	1·2	1·1	1·0	0·87	0·75	0·96	0·63	0·93
L. of leg / L. of trunk	4·72	5·21	5·81	5·62	4·66	5·54	5·4	4·92	5·05	3·58	4·1	2·6	5·36

* See also Calman, 1915, p. 28.

An examination of the syntypes showed that in specimens measuring under 5 mm. in trunk length the tarsus is either shorter than, or equal to, the propodus. Thus it would appear that the tarsus is short in young specimens and, as growth proceeds, it elongates more rapidly than does the propodus. Also, in immature specimens the femur is much shorter than, and the third walking leg (claw excluded) is 2·5–4 times as long as, the trunk. In adults the femur is subequal to or longer than, and the leg is 4·6–5·8 times as long as, the trunk (see measurements). In these respects the specimen from St. 170 differs markedly from small specimens of *P. antarcticum*. This species of five-legged Pycnogonida might prove of interest to the student of heterogonic growth in Arthropoda.

Genus Nymphon, Fabricius, 1794

A revision of the large genus *Nymphon*, comprising some ninety species, although a long and tedious business, is much needed. In addition to the fact that many species are very imperfectly described, the characters that serve to distinguish one species from another have never been comprehensively studied. It has not been possible to devote time to a complete revision of the genus at present; the study was therefore limited to Antarctic forms.

While much work has been done on material from Antarctic and sub-Antarctic waters during the last thirty years,[1] the relationships of the species are very imperfectly known and the key to their determination given by Loman (1923, p. 14—a modification and extension of that of Bouvier, 1913, p. 72) I found to be far from satisfactory. In order to identify the Discovery material with any degree of accuracy a revision[2] of all the Antarctic species had to be undertaken.

In several instances the type specimen is immature (*N. frigidum*, Hodgson; *N. longicollum*, Hoek; *N. lanare*, Hodgson and *N. tridentatum*, Hodgson), while not a few species are known only from the female (see Table III). The species in which the adult male is known fall into two main groups, each with several atypical or aberrant forms as listed below (see also Table III). The larger[3] (group I) includes most of the species referred to the genus "*Nymphon*"[4] by those authors who recognize two genera (e.g. Hodgson, Bouvier, Loman); the smaller (group II) includes those species referred to the genus "*Chaetonymphon*" as well as several forms hitherto regarded as belonging to "*Nymphon*", viz. *N. capense*, Hodgson, *N. compactum*, Hoek, and *N. articulare*, Hodgson.

The fact that the Antarctic species fall naturally into two main groups would seem to be strong evidence in support of the validity of the genus *Chaetonymphon*, Sars. But a careful study of all the characters, many of which are represented in tabular form

[1] E.g. Hodgson, 1907, 1908; Bouvier, 1906, 1913; Calman, 1915; Loman, 1923.

[2] The types of all the species included in Table III have been re-examined, with the exception of *N. subtile*, Loman; the Discovery specimens, however, are from the same locality as, and agree with Loman's description of, the type. (See also Gordon, 1932.)

[3] Seven of the species known only from female or immature specimens (Table III B) probably belong to group I; *N. villosum*, Hodgson belongs to group II and is allied to *N. biarticulatum* and *N. brevicaudatum*.

[4] When the word *Nymphon* is enclosed in inverted commas in the text it means *Nymphon sensu stricto* of certain authors, i.e. group I and the species listed above now placed in group II.

(Table III), shows that there is no distinctive character, or set of characters, that holds good everywhere. Indeed, exceptions abound—these will be mentioned in the discussion of each separate character—and as no practical advantage is to be gained by retaining a genus that is not definite and distinctive, I have reunited *Chaetonymphon* and *Nymphon* as Calman (1915, p. 28) and others have done.

Group I		Group II	
Typical	Atypical	Atypical	Typical
proceroides	*charcoti*	*capense*	*orcadense*
tenuipes		*compactum*	*articulare*
hiemale	*longicoxa*	*australe*	*neumayri*
gracillimum	*hamatum*		*brevicaudatum*
subtile	*brachyrhynchum*		*biarticulatum*
pfefferi	*clarencei*		*mendosum*
paucidens			*proximum*
adareanum			*bouvieri*

The main characters on which I rely for the separation of these groups are found in *the male oviger* (Table III). In the typical species of group I the fifth segment is long and slender, of approximately uniform diameter throughout, and either straight (type I, e.g. Fig. 10 *a* and *c*) or distinctly curved (type I *a*, Fig. 18 *a*). In *N. charcoti* the fifth segment is relatively short and more robust, but slightly curved and narrowed proximally (Fig. 10 *b*). The other four atypical species have the fifth segment long and slender, but distinctly expanded at the distal end though not to the same extent as is typical for group II (type I *b*, Fig. 23 *b*, cf. Fig. 27).

The majority of the species in group II have the fifth segment relatively short, usually more massive than in type I, and clubbed distally (type II, Figs. 23 *a*, 26 *a*, *c*, and 27). In the atypical species, the fifth segment is again short and rather robust, but certain parts of segments 5 and 6 or 3, 4 and 6 are thin-walled, inflated and tend to collapse when the animal is killed and fixed (type II *a*, Fig. 26 *b*, and Gordon, 1932, Figs. 10 *b* and 12 *b*).

None of the other characters is of such systematic importance as the male oviger, closely allied species often differing markedly from each other with regard to one or more of these; e.g. the chelophore of *N. paucidens*, n.sp., is very different from that of *N. pfefferi*, which not only in its oviger but in most of its other characters closely resembles it. The following survey of these characters follows the order in which they are dealt with in the specific descriptions.

Trunk. In group I, the trunk is usually slender, non-setose and loosely built, i.e. the lateral processes are separated by at least their own diameter. In *N. adareanum*, however, the lateral processes are separated by only half their own diameter.

In group II the body is usually compact and setose with the lateral processes in contact or separated by narrow intervals—up to half their own diameter. Setae are absent in three species—*N. capense*, *N. compactum* and *N. articulare*; in *N. australe* the lateral processes may be separated by their own diameter.

The neck is well defined and long, as a rule, in group I, very short in group II; but in several species of the former it is as short as in the latter group (e.g. *N. pfefferi* and *N. adareanum*).

Table III. *Antarctic species of* Nymphon.

		Specific name	Type of ♂ oviger	L. of trunk in mm.	Neck*	L. of abdomen	No. of spinules on each finger of chela	No. of denticulate spines on oviger
					Long / Medium / Short			
A. Species of *Nymphon* of which the adult male is known	Group I "Nymphon" group →	*proceroides*	I	3–5	l.	(E.) *m.c.*[1]	10–13	21–24
		tenuipes	I	2·5–3	l.	(E.) *d.l.*[4]	28–42	24–34
		hiemale	I	6·8–7·2	l.	(E.) *d.l.*[4]	27–40	36–46
		gracillimum	I	4·8–6·8	l.	(E.) *d.l.*[4]	22–33	33–34
		gracilipes	I	3·7–5·3	l.	(E.) *d.l.*[4]	14–22	54–59
		subtile	I *a*	2·5	l.	(E.) *d.l.*[4] +	14–22	26–34
		pfefferi	I *a*	2–2·2	s.	(E.) *d.c.*[1]	19–30	19–22
		paucidens	I *a*	2·5	m.→s.	(E.) *d.c.*[1] +	7–9	17–20
		adareanum	I *a*	1·6–1·75	s.	(E.) *d.c.*[1]	6–8	5–9
	← ? Transitional forms → II	*charcoti*	...	10 –18·5	m.	(E.) *d.l.*[4] –	65–90 and 75–110	40–51
		longicoxa	I *b*	6·8	l.§←m.	(E.) *d.l.*[4] +	70 and 95	38–44
		hamatum	I *b*	7·2–8·4	l.§←m.	(E.) *m.c.*[1]	50–65	29–37
	III	*brachyrhynchum*	I *b*	4–4·2	m.←s.	(E.) *m.c.*[1]	40–60	36–37
		clarencei	I *b*	6·4–8·2	m.←s.	(E.) *d.l.*[4]	30–45	35–40
	← "Chaetonymphon" group →	*capense*	II *a*	2·75	s.	(E.) *d.l.*[4] +	60–65	48–50
		compactum	II *a*	6–7	s.	*d.c.*[1] –	40–48	36–38
	IV	*australe*	II *a*	4·5–5·2	m.←s.	*d.c.*[1]	38–46	23–37
		orcadense	II	4·8–6·4	s.	*m.c.*[1]	35–46	30–36
		articulare	II	2·5	s.	*d.c.*[1]	18–25	24–26
		neumayri‖	II	4–4·4	s.	*m.c.*[2]	6–9	22–27
		brevicaudatum‖	II	3·5–5	s.	*d.c.*[1] +	29 and 35	10–17
	V	*biarticulatum*‖	II	5–5·8	s.	*m.c.*[2]	30–33 and 40–42	12–18
		mendosum‖	II	4–5	s.	*m.c.*[2] +	20	11–12
		proximum‖	II	5	s.	*d.c.*[1] +	9 and 14	15
		bouvieri‖	II	3·6	s.	*m.c.*[2]	12–16	15–18
B. Species of *Nymphon* known only from female or immature specimens		*procerum*§¶	...	7·2	l.§	(E.) *m.c.*[1]	38 and 55	30
		distensum ¶	...	...	l.	*d.l.*[4] +	30–33 and 60–64	42
		signatum ¶	...	...	... ...	*d.l.*[4] +	35 and 62	37
		multidens	...	3·4	m.	(E.) *d.l.*[4]	24–28	73
		*lanare***	...	7·5	l. ←m.	*d.l.*[4] –	48 and 55	24
		*longicollum***	...	4·2	l.	(E.) *d.l.*[4]	11 and 12	25
		*frigidum***	...	2·3	l.	*d.l.*[4]	15–16	21
		villosum‖¶	...	4·2	s.	*d.c.*[1] +	18 and 22	16

* The neck is regarded as short when the base of the oviger occupies the whole or two-thirds of the space between first lateral process and anterior cephalic lobe; of medium length when it occupies approximately half, and long when it only occupies one-third or less, of this space.

† Where the second is more than one-third longer than the first tibia the ratio t_2/t_1 is given in brackets.

‡ See p. 42.

§ In these three species the base of the oviger is situated midway between first lateral process and cephalic lobe.

The base of the oviger is in contact with, or only a little in front of the first lateral process as a general rule, in both groups; in three exceptional cases it is situated much farther forward, arising from the middle of the long neck—*N. longicoxa*, *N. hamatum* and *N. procerum*.

Abdomen. In group I the abdomen is elevated at an angle of 30–45° as a rule, and

Table III (*contd.*)

Palp L. of segments 4 + 5 / L. of segment	No. of femoral gland-openings in ♂	Third leg: L. of coxa 2 / L. of coxae 1 + 3 in ♂ (or ♀)	Third leg: Longest tibial† segment	Third leg: L. of tarsus / L. of propodus	Third leg: L. of claw / L. of propodus	Third leg: Auxiliary claws	Femur of ♀ L. / max. W.	Specific name		
1·3	9–12 T.	1·5–1·7	t_1	1 ±	$\frac{3}{5}$	–	5·3–5·7	*proceroides*	I	A. Species of *Nymphon* of which the adult male is known
1	6–7	2	t_2	1 +	1 ±	–	8	*tenuipes*		
1 +	12–16‡	1·8–1·95	t_2 (1·5)	1 –	$\frac{1}{2}$ –	+	8·5–9·5	*hiemale*		
0·75–0·85	10 T.‡	2 –	t_2 (1·4)	$1\frac{1}{3}$–$1\frac{1}{4}$	$\frac{1}{2}$ –	+		*gracillimum*		
1·3	13–16	1·5	t_2 (1·5)	1 +	$\frac{1}{3}$ –	+	10–12	*gracilipes*		
1	8–9	1·5–1·75	t_2	$\frac{3}{5}$	$\frac{1}{3}$	+	6·5	*subtile*		
1 –	4 T.	1 +	t_2	$\frac{3}{5}$	$\frac{1}{3}$	+	4–5	*pfefferi*		
1	4 T.	1 +	t_2	$\frac{1}{2}$	$\frac{1}{3}$	+	5·3	*paucidens*		
0·6 –0·7	2–3 T.	1 +	t_2	$\frac{1}{4}$	$\frac{1}{2}$ ±	+	3·5	*adareanum*		
2 +	20	1 +	t_2	1 ±	1 ±	–	11–12	*charcoti*	II	
0·65–0·7	? 8	2 +	t_2 (1·6)	$\frac{3}{4}$	$\frac{3}{5}$	–	10	*longicoxa*	III	
0·7–0·8	12–13 T.	1·4	t_1	1 + –$\frac{2}{3}$	$\frac{1}{2}$ –	–	10	*hamatum*		
2·5	?30	2	t_2	$\frac{2}{3}$	$\frac{1}{2}$	+	5·4	*brachyrhynchum*		
1·3	10–12	2–1·75	t_2 (1·4)	$\frac{2}{3}$	$\frac{1}{2}$	+	5	*clarencei*		
1 +	?	1·2	t_2	$\frac{4}{5}$	$\frac{3}{4}$	–	4·7	*capense*	IV	
1·2–1	20–27	1 +	t_1	2	$\frac{1}{2}$ +	–	4·7	*compactum*		
1 ±	16–18	1 +	t_1	$1\frac{1}{2}$–$1\frac{1}{4}$	$\frac{1}{2}$ –	v.	3·5–4·5	*australe*		
1 ±	30	1 +	t_2	$1\frac{1}{3}$–1	$\frac{1}{2}$ –	+	3·8	*orcadense*	V	
0·78	?	1	t_1	1 –	$\frac{1}{2}$ –	+	3	*articulare*		
0·75	?	1	t_1	1 ±	$\frac{1}{2}$	+	2·5	*neumayri*‖		
0·4–0·54	3–4 T.	1	t_1	$\frac{4}{5}$	$\frac{1}{2}$ +	+	2·3	*brevicaudatum*‖		
0·4–0·5	5–6 T.	1	t_1	$1\frac{1}{4}$ – 1	$\frac{1}{2}$ ±	+	2·4	*biarticulatum*‖		
0·35–0·44	4–5 T.	1	t_1	$\frac{4}{5}$ +	$\frac{1}{2}$ ±	+	3·2	*mendosum*‖		
0·42	5–7 T.	1	t_1	$\frac{4}{5}$	$\frac{1}{2}$ –	+		*proximum*‖		
0·26–0·28	3–4 T.	1	t_1	$\frac{2}{3}$	$\frac{1}{2}$ –	+	2·2	*bouvieri*‖		
1 +	...	1 +	t_2	$\frac{1}{2}$ +	$\frac{1}{3}$ –	–	8·4	*procerum*§¶		B. Species of *Nymphon* known only from female or immature specimens
0·78	...	...	t_2 (1·46)	$\frac{2}{4}$	$\frac{2}{3}$ –	+	...	*distensum*¶		
0·96	...	...	t_2	...	...	+	...	*signatum*¶		
0·88	...	1·5	t_2 (1·5)	$\frac{1}{2}$	$\frac{1}{4}$ –	+	6·6	*multidens*		
2	...	1 +	t_2	1 +	$\frac{1}{6}$	–	...	*lanare***		
0·83	...	2·86	t_2	1	$\frac{1}{2}$ –	–	...	*longicollum***		
1	...	1	t_2	$\frac{1}{2}$	$\frac{1}{2}$ –	+	...	*frigidum***		
0·66	...	...	t_1	$\frac{4}{5}$	$\frac{1}{2}$ +	+	3	*villosum*‖¶		

‖ Species with the last two body segments fused.
¶ Species known only from adult female.
** Species known only from immature specimens.
Explanation of lettering used:—*d.* = to distal end of; *m.* = to middle of; $l.^4$ = fourth lateral process; $c.^1$ and $c.^2$ first and second coxae respectively; t_1 and t_2 first and second tibia respectively; T. raised femoral gland tubercles present; v. vestigial; (E.) elevated.

rarely extends beyond the middle of the first coxa. In group II it is not elevated above 10° except in *N. capense* (45°), and generally extends at least to the distal end of the first coxa (see Table III for exceptions).

Chelophore. In group II the scape often bears a number of long, rather stout setae;

in several species, however, these setae are short and few in number, e.g. *N. articulare*, *N. capense*, *N. compactum*. In group I, the setae, as a rule, are either few and fine or wanting; in a few exceptional cases (e.g. *N. adareanum*, Gordon, 1932, p. 99, fig. 1 *a*) a few strong setae are present.

With regard to the chela there is so much variation in each group that no generalization[1] can be made. The palm may be shorter than wide (*N. proceroides* and *N. neumayri*, n.sp. (Figs. 9 and 29 *d*), or as much as 3–4 times as long as wide (*N. biarticulatum*, *N. longicoxa*, *N. procerum*, Fig. 32 *a* and Gordon, 1932, figs. 7 and 9 *a*). The number of spinules on each finger of the chela is very variable (6–110, see Table III); in a few instances there are many more spinules on one finger than on the other, e.g. *N. longicoxa* (70 and 90–110).

Palp. Segments 2–5 are long and subequal in a few exceptional cases (*N. charcoti*, *Nymphon*, sp.? (St. 181), *N. lanare* and *N. brachyrhynchum*—the last is not closely related to the other species). In all other forms, segments 2–5 are of different lengths and segment 2 is usually longest although the third may not be much shorter. As a general rule the ratio $\frac{\text{length of segments } 4 + 5}{\text{length of segment } 2}$ lies between 0·75 and 1·3; in five species of group II it is less than 0·6 (usually less than 0·5, see Table III).

Number of spines on oviger. With one exception (*N. adareanum*, Hodgson, 1907, pl. iii, fig. 3 *b*) each of the four terminal segments of the oviger bears a number of denticulate spines. Loman (1923, p. 11) has shown that the total number of these spines remains within certain definite limits for each species. This total may be less than ten or as high as seventy in exceptional cases (see Table III); also it may be the same in several unrelated species, e.g. 30–38 in *N. tenuipes*, *N. hamatum* and *N. brachyrhynchum* of group I and *N. australe*, *N. compactum* and *N. orcadense* of group II.

Third leg. In all the species of group II and most of those of group I *a* (in which segment 5 of the male oviger is long, slender and distinctly curved) and in *N. charcoti* the second coxa is approximately equal in length[2] to the sum of the first and third. In all the other species of group I the second coxa, especially in the male, is much longer. The femoral gland openings in the male vary greatly in number; in several instances they have not been detected. In the female, the femur is at least five times as long as wide in all species of group I, *N. pfefferi* and *N. adareanum* excepted. In group II it is usually less than four times as long as wide, but is nearly five times in each of the atypical forms.

The second is longer than the first tibia, as a rule, in group I, and the reverse holds for most of the species in group II (Table III).

[1] Loman (1923, p. 10) says that in "*Nymphon*" the "hand" is not conspicuously broadened distally, whereas in "*Chaetonymphon*" it is much broadened distally, but I am afraid I do not quite understand this distinction. The palm in Figs. 32 and 29 *d* is not much broadened distally, yet these species are typical "*Chaetonymphons*". The only Antarctic species in which the palm is broadened distally is *N. multidens*, n.sp. (Fig. 35 *d*).

[2] The dorsal measurements are always given for the segments of the leg so that the third coxa is much shorter than if measured ventrally.

The auxiliary claws are usually well developed, but may be absent or, as in one case, vestigial. The presence or absence of these claws has been used as the first division in Key II, which is not concerned with possible relationships between the species, because this character is (1) convenient and (2) is, so far as our knowledge goes, constant for each species at all stages from immature to adult, and in both sexes.

The third leg is 5–7 times as long as the trunk, and either smooth or slightly setose in group I. In group II it is 3–4·5 times as long as the trunk in all forms except *N. capense* and *N. compactum* (6); while the legs are usually very setose, the two species just mentioned and *N. articulare* are again exceptions.

Synonymy. With regard to synonymy, *N. gracillimum*, Calman, may prove to be the same as *N. hiemale*, Hodgson; *N. charcoti*, Bouvier, with *N. lanare*, Hodgson, and *N. biarticulatum*, Hodgson, with *N. brevicaudatum*, Miers.

SYNOPTIC KEY TO THE DETERMINATION OF THE ADULT MALES OF ANTARCTIC AND SUB-ANTARCTIC SPECIES OF *NYMPHON*[1]

I. Segment 5 of ♂ oviger long and narrow, straight or distinctly curved, of approximately uniform diameter throughout.

A. Auxiliary claws absent [tarsus and propodus both elongated, subequal, without spines on ventral margin; second coxa long, segment 5 of ♂ oviger straight (type I)].

1. Less than 20 (10–13) spinules on each finger of chela; 21–24 denticulate spines on oviger; 9–12 low femoral gland-tubercles; first tibia the longest segment; claw three-fifths of propodus.....*N. proceroides*, Bouvier

2. More than 20 (28–42) spinules on each finger of chela; 24–34 denticulate spines on oviger; 6–7 femoral gland-openings, but no raised tubercles; second tibia the longest segment; claw subequal to propodus.....*N. tenuipes*, Bouvier

B. Auxiliary claws well developed [second tibia the longest segment].

1. Segment 5 of ♂ oviger straight (type I).

a. Number of denticulate spines less than 50 (30–46).

i. Two terminal palpal segments together equal to or slightly longer than second segment; tarsus rather shorter than propodus; 12–16 femoral gland-openings—low tubercles occasionally present .....*N. hiemale*, Hodgson

ii. Two terminal palpal segments together rather shorter than second segment; tarsus considerably longer than propodus; 10 low femoral gland tubercles *N. gracillimum*, Calman

b. Number of denticulate spines exceeding 50 [14–22 spinules on each finger of chela; 13–16 small femoral gland-openings] .....*N. gracilipes*, Miers

[1] Use in conjunction with Table III, p. 28; the large Roman numerals in the left-hand column of table represent the five primary subdivisions of the key. Slight discrepancies in the numbers of spines on the fingers of the chela or of the oviger may occur, but are not important—e.g. in Table III the number of spines of each finger of the chela of a single specimen of *N. longicoxa* is given, while in the key the lowest and the highest number of spines on the movable finger of several adults is given. In Table III the ratios represented by fractions are only approximate; where decimals are employed a higher degree of accuracy has been aimed at.

2. Segment 5 of ♂ oviger distinctly curved (type I *a*).
   a. More than 10 spinules on each finger of chela (20–30 in adults).
      i. 26–34 denticulate spines on oviger; second coxa at least half as long again as the sum of the first and third; 8–9 femoral gland-openings, but no raised tubercles; tarsus at least half as long as propodus .....*N. subtile*, Loman
      ii. 19–22 denticulate spines on oviger; second coxa scarcely longer than the sum of the first and third; 4 wide femoral gland-tubercles; tarsus only one-third of propodus.....*N. pfefferi*, Loman
   b. Less than 10 (6–9) spinules on each finger of chela [2–4 low, wide femoral gland-tubercles].
      i. Number of denticulate spines on oviger 17–20; tarsus half of propodus; ventral margin of the latter setose.....*N. paucidens*, n.sp.
      ii. Number of spines on oviger 5–9, *not denticulate*; tarsus one-fourth of propodus; ventral margin of the latter spinose .....*N. adareanum*, Hodgson

II. Segment 5 of ♂ oviger relatively short—less than twice as long as segment 6—and stout, narrowed and slightly curved in proximal third (Fig. 10 *b*) [palpal segments 2–5 subequal, long; auxiliary claws absent; second tibia the longest segment; 20 femoral gland-openings; 40–50 denticulate spines on oviger; 75–110 spinules on movable finger of chela (10–20 less on immovable one); tarsus, propodus and claws subequal] ...*N. charcoti*, Bouvier

III. Segment 5 of ♂ oviger long and slender; expanded somewhat at distal end (type I *b*) [total number of denticulate spines on oviger 30–44].
   A. Neck relatively long with oviger base inserted midway between first lateral process and anterior cephalic lobe; auxiliary claws absent [chela long and sickle shaped; two terminal palpal segments together $\frac{2}{3}$–$\frac{3}{4}$ of second segment].
      1. Second coxa more than twice the sum of the first and third; second tibia the longest segment; 90–110 spinules on movable finger of chela; eyes present *N. longicoxa*, Hoek
      2. Second coxa less than twice the sum of the first and third (1·4 : 1); first tibia the longest segment; 60–65 spinules on movable finger of chela; eyes absent [spur on distal end of femur; 12–13 femoral gland-tubercles].....*N. hamatum*, Hoek
   B. Neck relatively short, oviger base in contact with first lateral process; auxiliary claws present [second tibia the longest segment; second coxa long].
      1. Palpal segments 3 and 4 subequal and longer than 2 and 5 which are again subequal; fingers of chela curved inwards towards scape distally, each armed with 40–60 spinules; 30 femoral gland-openings .....*N. brachyrhynchum*, Hoek
      2. Palpal segments 4 and 5 together rather longer than second segment, 2 and 3 subequal; fingers of chela not curved distally, each armed with 30–45 spinules; 10–12 femoral gland-openings .....*N. clarencei*, n.sp.

IV. Segment 5 of ♂ oviger relatively short, portions of segments 5 and 6 or 3, 4 and 6 thin-walled, inflated, often partially collapsed in fixed material (type II *a*); neck short, body rather compact; auxiliary claws absent or vestigial.
   A. Second tibia the longest segment; 60–65 spinules on each finger of chela; 48–50 denticulate spines on oviger; tarsus shorter than propodus (4 : 5) [portions of segments 3, 4 and 6 of ♂ oviger thin-walled, segment 6 setose on the thin-walled area, segment 5 short, slightly curved and widening gradually towards the distal end] *N. capense*, Hodgson

B. First tibia the longest segment; 38–48 spinules on each finger of chela; 23–38 denticulate spines on oviger; tarsus longer than propodus.

1. Auxiliary claws absent; tarsus twice as long as propodus; segment 5 of ♂ oviger short, considerably expanded in distal half; 20–27 femoral gland-openings *N. compactum*, Hoek

2. Auxiliary claws vestigial; tarsus not more than half as long again as propodus; segment 5 of ♂ oviger greatly inflated in distal half (thin-walled part usually collapsed); 16–18 femoral gland-openings ..... *N. australe*, Hodgson

V. Segment 5 of ♂ oviger relatively short and distinctly clubbed at distal end (type II); neck short and body compact; auxiliary claws well developed.

A. Two terminal palpal segments together at least three-fourths of second segment; no femoral gland-tubercles; number of denticulate spines on oviger exceeding 20 (22–36) in adults.

1. Second tibia the longest segment; 30–36 denticulate spines on oviger; 35–46 spinules on each finger of chela; two terminal palpal segments together subequal to second segment; 30 femoral gland-openings ..... *N. orcadense*, Hodgson

2. First tibia the longest segment; 22–27 denticulate spines on oviger; less than 30 spinules on each finger of chela; two terminal palpal segments together three-fourths of second segment; femoral gland-openings not observed.

a. 18–25 short curved spinules on each finger of chela; palm approximately twice as long as high ..... *N. articulare*, Hodgson

b. 6–9 long spinules on each finger of chela; palm only as long as high [trunk segments 3 and 4 fused] ..... *N. neumayri*, n.sp.

B. Two terminal palpal segments together approximately one-half to one-fourth of second segment; 3–7 wide femoral gland-tubercles; number of denticulate spines on oviger less than 20 (10–18) [first tibia the longest segment; trunk segments 3 and 4 fused].

1. Number of spinules on each finger of chela exceeding 25 (28–45).

a. Ocular tubercle of medium height; fingers of chela rather shorter than palm; tarsus in adults considerably shorter than propodus (much shorter in immature specimens) ..... *N. brevicaudatum*, Miers

b. Ocular tubercle high; fingers of chela equal to or rather longer than palm; tarsus in adults rather longer than, in immature specimens subequal to, propodus ..... *N. biarticulatum*, Hodgson

2. Number of spinules on each finger of chela less than 25 (9–20).

a. Fingers longer than palm [each armed with approximately 20 spinules; 2–3 short, spinose projections on each lateral process and each first coxa; tarsus and propodus spinose] ..... *N. mendosum*, Hodgson

b. Fingers shorter than palm.

i. Ocular tubercle only as high as wide; two terminal palpal segments together two-fifths of second segment; setae on legs much shorter than the diameter of the segments carrying them ..... *N. proximum*, Calman

ii. Ocular tubercle long and slender, 4–6 times as high as wide; two terminal segments very short, together only one-fourth of second segment; long setae on scape, lateral processes and legs, equal to or longer than the diameter of the segments carrying them..... *N. bouvieri*, n.sp.

ARTIFICIAL KEY TO THE DETERMINATION OF ANTARCTIC AND SUB-ANTARCTIC SPECIES OF *NYMPHON*

1. Auxiliary claws absent or vestigial 2
   Auxiliary claws well developed 12

2. Four terminal palpal segments long, subequal 3
   Four terminal palpal segments of different size; two terminal segments together from $\frac{2}{3}$–$1\frac{1}{3}$ of second segment 4

3. 40–51 denticulate spines in adults; 90–110 spinules on movable finger of chela; legs smooth; ♂ oviger as in Fig. 10 *b*. ..... *N. charcoti*, Bouvier
   30–31 denticulate spines in adults; 70–85 spinules on fingers of chela; legs setose, setae very fine ..... *N. charcoti* var. (? = *lanare*, Hodgson)

4. Oviger base arises from middle of neck 5
   Oviger base in contact with first lateral process 7

5. Eyes well developed [second tibia the longer segment; 90–100 spinules on movable finger of chela which has the tip recurved] ..... *N. longicoxa*, Hoek
   Eyes absent; ocular tubercle obsolete 6

6. Spur on distal end of femur; first tibia rather longer than second; 50–65 spinules on each finger of chela; tarsus and propodus subequal ..... *N. hamatum*, Hoek
   No spur on distal end of femur; second tibia the longer segment; 38 and 55 spinules on each finger of chela; tarsus just over one-half of propodus ..... *N. procerum*, Hoek

7. Neck long, lateral processes separated by their own diameter or more 8
   Neck short, lateral processes separated by half their own diameter, or less, as a rule 10

8. Spinules on each finger of chela less than 20 (10–13) 9
   Spinules on each finger of chela more than 20 (28–42) [palm long and narrow; ♂ oviger of type I second tibia the longest segment; 3–4 long setae at distal end of femur] *N. tenuipes*, Bouvier

9. Eyes well developed palm very short; ♂ oviger of type I; first tibia the longer segment; second coxa half as long again as the sum of the other two ..... *N. proceroides*, Bouvier
   Eyes absent, though ocular tubercle present; second tibia the longest segment; second coxa nearly three times the sum of the other two ..... *N. longicollum*, Hoek

10. First tibia the longer segment; tarsus longer than propodus; 38–48 spinules on each finger of chela; 23–38 denticulate spines on oviger 11
    Second tibia the longer segment; tarsus four-fifths of propodus; 60–65 spinules on each finger of chela; 48–50 denticulate spines on oviger ..... *N. capense*, Hodgson

11. Eyes and ocular tubercle absent; tarsus twice as long as propodus ..... *N. compactum*, Hoek
    Eyes present, ocular tubercle high; tarsus half as long again as propodus or rather less *N. australe*, Hodgson

12. Spines on four terminal segments of oviger not denticulate and numbering less than 10 (5–9) [♂ oviger of type I *a*; 6–9 spinules on each finger of chela; tarsus one-fourth of propodus, the latter spinose on ventral margin; neck short] ... *N. adareanum*, Hodgson
    Spines on four terminal segments of oviger denticulate 13

13. Four terminal segments of palp each long, third and fourth subequal and longer than second and fifth which are again subequal [♂ oviger of type I *b*; 40–60 spinules on each finger of chela, fingers slender and bent distally] ..... *N. brachyrhynchum*, Hoek
    Four terminal segments of palp of different size; two terminal segments together vary from equality with, to one-fourth of, second segment 14

14. Second tibia the longer segment 15
First tibia the longer segment [♂ oviger of type II] 21

15. Total number of denticulate spines on oviger at least 70; chela with immovable finger very short, only half of palm, 24–28 crowded spinules on each finger; tarsus half of propodus. *N. multidens*, n.sp.
Total number of denticulate spines on oviger 54–59; 14–22 spinules on each finger of chela; tarsus and propodus subequal [♂ oviger of type I] ..... *N. gracilipes*, Miers
Total number of denticulate spines on oviger 46–30 16
Total number of denticulate spines on oviger less than 25 20

16. Approximately twice as many spinules on movable as on immovable finger of chela { *N. distensum*, Möbius[1] / *N. signatum*, Möbius
An almost equal number of spinules on each finger of chela or difference not exceeding 25 per cent. 17

17. Second coxa half as long again the sum of the first and third or longer 18
Second coxa short, subequal to the sum of the other two [neck short; ♂ oviger of type II and segment 7 termino-laterally articulated on segment 6; 40–46 spinules on each finger of chela; at least 30 femoral gland-openings in ♂] ..... *N. orcadense*, Hodgson

18. Tarsus and propodus subequal ($\frac{4}{5}$–$\frac{5}{4}$); 27–40 spinules on each finger of chela; ♂ oviger of type I; 10–16 femoral gland-openings in ♂ ..... *N. hiemale*, Hodgson (? = *N. gracillimum*, Calman)
Tarsus $\frac{1}{2}$–$\frac{2}{3}$ of propodus 19

19. Neck long; 14–24 spinules on each finger of chela; oviger of type I *a* and 4 femoral gland-tubercles in ♂ ..... *N. subtile*, Loman
Neck short to medium; 30–45 spinules on each finger of chela; oviger of type I *b* and 10–12 femoral gland-openings in ♂ ..... *N. clarenci*, n.sp.

20. Less than 10 spinules on each finger of chela; tarsus half of propodus; oviger of type I *a* and 4 femoral gland-tubercles in ♂ ..... *N. paucidens*, n.sp.
[15–16 spinules on each finger of chela; neck long; tarsus half of propodus, the latter spinose on ventral margin (type immature) ..... *N. frigidum*, Hodgson]
19–30 spinules on each finger of chela; tarsus one-third of propodus; neck short; oviger of type I *a* and 4 femoral gland-tubercles in ♂ ..... *N. pfefferi*, Loman (= *N. antarcticum*, Pfeffer)

21. Number of denticulate spines on oviger exceeding 20 [two terminal palpal segments together three-fourths of second segment; femur much enlarged in ♀] 22
Number of denticulate spines on oviger less than 20 [and trunk segments 3 and 4 fused] ... 23

22. 6–9 long spinules on each finger of chela, fingers curved, gaping; palm only as long as high [trunk segments 3 and 4 fused] ..... *N. neumayri*, n.sp.
18–25 short, curved spinules on each finger of chela; palm approximately twice as long as high ..... *N. articulare*, Hodgson

23. Two terminal palpal segments together two-thirds of second segment; 18–22 spinules on each finger of chela ..... *N. villosum*, Hodgson
Two terminal palpal segments together one-half of second segment or rather less 24
Two terminal palpal segments together one-fourth of second segment; ocular tubercle very slender and 4–6 times as high as wide ..... *N. bouvieri*, n.sp.

24. Number of spinules on each finger of chela exceeding 30; ocular tubercle higher than wide ... 25
Number of spinules on each finger of chela less than 20; ocular tubercle low and wide 26

[1] These two species appear to differ somewhat, but each is imperfectly known.

25. Ocular tubercle of medium height; fingers rather shorter than palm; tarsus somewhat shorter than propodus in adults, much shorter in young specimens
N. brevicaudatum, Miers

Ocular tubercle high; fingers equal to or rather longer than palm; tarsus scarcely shorter than propodus in young, rather longer than the latter in adults
N. biarticulatum, Hodgson

26. Fingers longer than palm, spinules long and numbering about 20; 2 or 3 short spinose projections on each lateral process and each first coxa .....*N. mendosum*, Hodgson

Fingers shorter than palm, spinules short, numbering 9 on immovable, 14 on movable finger; no spinose projections on lateral processes or first coxae.....*N. proximum*, Calman

A. GROUP I

Nymphon proceroides, Bouvier (Figs. 9, 10 *a* and 75).

Bouvier, 1913, pp. 90–94, text-figs. 42–50.
Loman, 1923, p. 14 (in key).

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; M. Large otter trawl: a dozen specimens with *N. tenuipes* and *Nymphon* sp.?

St. 182. 14. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 21′ S, 62° 58′ W, 278–500 m.; M. Large otter trawl: 2 ♀♀, 4 ♂♂ and 2 immature specimens.

St. 186. 16. iii. 27. Fournier Bay, Anvers Island, Palmer Archipelago, 64° 25′ 30″ S, 63° 02′ W, 295 m.; M. Large dredge: 3 ♂♂.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259 m.; M. Large dredge: a dozen specimens.

Description of male. *Trunk* of loose build, lateral processes widely separated—up to twice their own diameter. Neck long, base of oviger in contact with first lateral process. Ocular tubercle low, wide, rounded; eyes well developed.

Proboscis short, robust, sub-cylindrical, much shorter than cephalon.

Abdomen reaching to middle of first coxa, elevated at an angle of about 20°.

Chelophore. Scape rather longer than proboscis, length 3·5–4 times the distal width. Palm very short and high; fingers twice as long as palm, each armed with 10–13 curved spinules as represented in Fig. 9; setose pad extending nearly half-way along immovable finger.

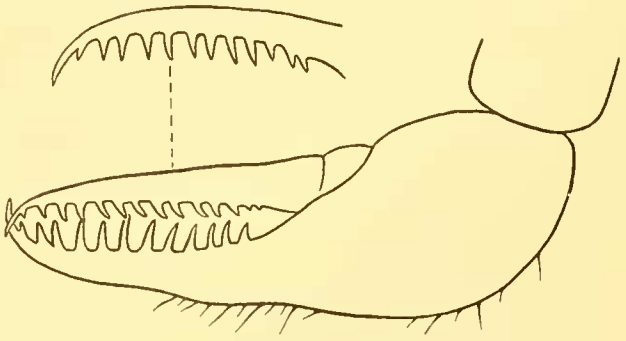

Fig. 9. *Nymphon proceroides*, Bouvier. Chela: × 60.

Palp. Third a little longer than, two terminal segments together longer than, second segment (1·25–1·33 : 1); segments 2–5 in the proportions 3·25 : 3·5 : 2·5 : 1·65.

Oviger (type I). Terminal claw approximately two-thirds of tenth segment, armed with 4–7 spinules. Total number of denticulate spines 21–24. Segments 4–6 in the proportions 2·14 : 2·86 : 1 (♀ 1·5 : 2 : 1); fifth segment nearly straight, long, and of almost uniform diameter throughout (Fig. 10 *a*).

Third leg. Second coxa long and slender, half as long again as the sum of the other two (1·5–1·7 : 1). Femur slightly shorter than second tibia; a row of 9–12 prominent gland papillae on proximal, mid-ventral surface. First tibia the longest segment, half as long again as femur. Tarsus and propodus both elongated, subequal; claw long, about three-fifths of propodus; auxiliaries absent.

Measurements (mm.)

	♀
Length of proboscis	1·2
Diameter of proboscis	0·67
Length of trunk	5·0
Length of cephalic segment	2·13
Width of anterior cephalic lobes ...	1·07
Width of neck	0·4
Width across second lateral processes	2·6
Length of abdomen	0·93

Third leg:	♀	♂
First coxa	0·8	0·7
Second coxa	2·0	1·7
Third coxa	0·8	0·53
Femur	3·6	3·4
First tibia	5·47	4·6
Second tibia	4·0	3·7
Tarsus	1·55	1·47
Propodus	1·65	1·47
Claw	1·0	0·93

Remarks. Bouvier has given a long and careful description of this species; Fig. 75 represents an abnormal palp of a co-type in the Paris Museum collection. The Discovery specimens agree very closely with the types.

This species is most closely allied to *N. tenuipes*, Bouvier (p. 39), but can readily be distinguished from the latter by (1) the chela with its shorter palm and fewer spinules on the fingers, and (2) the absence of very long setae on the walking legs.

Distribution. Previously recorded from the South Shetlands.

Nymphon tenuipes, Bouvier (Figs. 10*c* and 11).

Bouvier, 1913, pp. 86–90, text-figs. 35–41.
Loman, 1923, p. 14 (in key).

St. 177. 5. iii. 27. 27 miles SW of Deception Island, South Shetlands, 63° 17′ 30″ S, 61° 17′ W, 1080 m.; M. cs. St. Large dredge: 1 ♂.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; M. Large otter trawl: 1 ♀ and 5 immature specimens.

Description of mature male. *Trunk* slender and loosely built; lateral processes separated by one and a half, to more than twice, their own diameter. Neck long, base of oviger in contact with first lateral process. Ocular tubercle low, broad, rounded at apex; eyes well developed.

Proboscis sub-cylindrical, three-fourths of scape and of cephalon.

Abdomen short, reaching to distal end of fourth lateral process, elevated at an angle of about 40–45°.

Chelophore slender. Scape with a few fine setae; length six times the distal width. Chela subequal to scape, palm long and narrow, setose pad very short; fingers armed with about 39 and 42 spinules respectively (Fig. 11 *b*).

Palp slender. Segments 2–5 in the proportions 10 : 6·5 : 5 : 5.

Oviger long and slender. Terminal claw a little shorter than tenth segment, armed with ten long spinules. Total number of denticulate spines 34 (10 + 9 + 7 + 8). Segments 4–6 in the proportions 2 : 3·43 : 1; fifth segment long, slender, nearly straight, and of almost uniform diameter throughout (Fig. 10 *c*).

Third leg long and slender. Second coxa twice the sum of the other two. Femur shorter than either tibia; three very long, slender setae dorsally at distal articulation; no distinct raised gland tubercles on mid-ventral surface but six or seven obscure gland openings present. Both tibias bearing long slender setae (Bouvier, 1913, fig. 41), second the longest segment. Tarsus, propodus and claw elongated; claw shorter than propodus in this specimen (but equal to or even slightly longer than propodus in the other specimens). Auxiliaries absent.

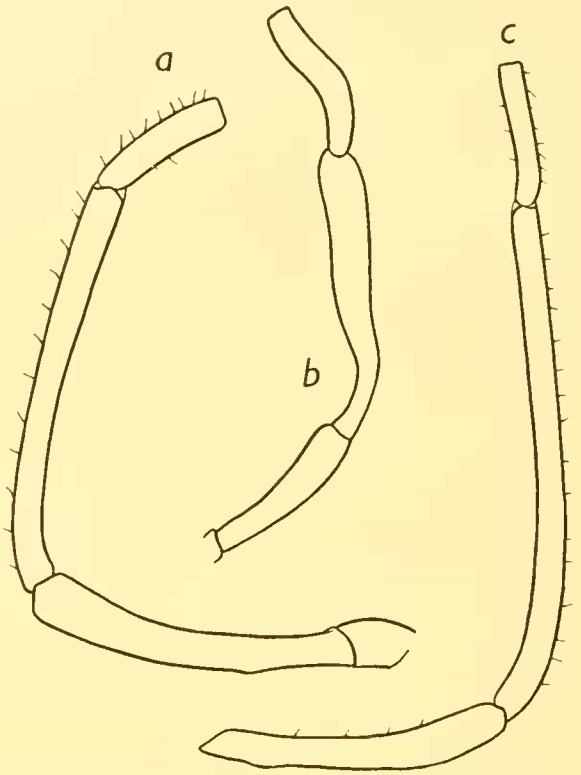

Fig. 10. Segments 4–6 of male oviger of: *a. Nymphon proceroides*, Bouvier: × 27. *b. N. charcoti*, Bouvier: × 7. *c. N. tenuipes*, Bouvier: × 27.

Female. One specimen from St. 181 is undoubtedly a female of this species, but it differs from the normal female in one interesting respect. The two posterior pairs of walking legs are quite typical; each second coxa is enlarged distally and has a large genital pore; the femur is considerably widened proximally and contains developing ova (Fig. 11 *a*).

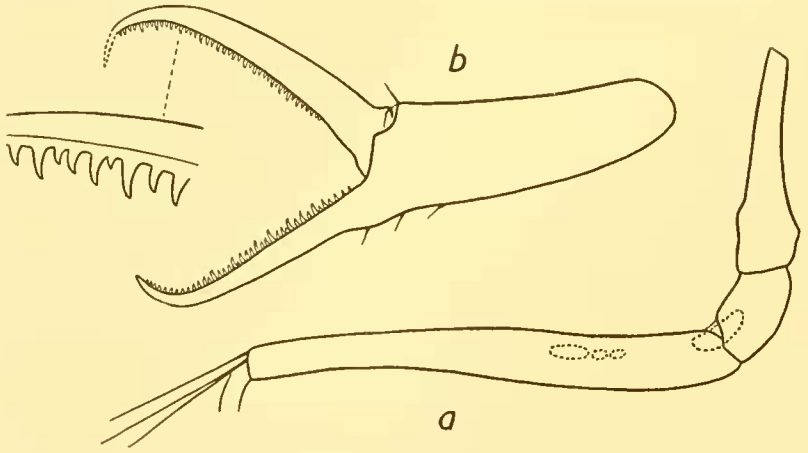

Fig. 11. *Nymphon tenuipes*, Bouvier. *a*. Femur and two distal coxae of third leg of female: × 20. *b*. Chela × 60.

The two anterior pairs of legs, however, are short,[1] slender like those of immature specimens, and have no genital pores.

The oviger is of the usual female type; the fifth is scarcely longer than the fourth, and twice as long as the sixth segment. The total number of denticulate spines is 32 (9 + 8 + 7 + 8).

Measurements (mm.)

	St. 177 ♂		St. 181 ♀
Length of proboscis	0·9		1·0
Diameter of proboscis	0·37		0·47
Length of trunk	2·8		2·95
Length of cephalic segment ...	1·23		1·35
Width of anterior cephalic lobes ...	0·5		0·55
Width of neck	0·25		0·3
Width across second lateral processes	1·33		1·2
Length of abdomen	0·35		0·5
Leg:	(3rd)	(4th)	(1st)
First coxa	0·4	0·4	0·4
Second coxa	1·4	1·6	1·1
Third coxa	0·3	0·35	0·3
Femur	3·33	3·4	2·13
First tibia	4·7	4·93	2·67
Second tibia	5·0	5·47	2·8
Tarsus	1·5	1·6	0·73
Propodus	1·33	1·33	0·73
Claw	1·0	1·25	0·59

Remarks. This is a very small species; Bouvier states that the holotype is immature, but it is in reality an almost, if not quite, mature male. There are 32–33 denticulate spines on the oviger and about twelve spinules on the terminal claw, although the latter have been omitted in Fig. 38 (Bouvier, 1913, p. 88). The spinules on the fingers of the chela number approximately 24 and 30–35 respectively.

N. temipes is most nearly related to *N. proceroides*, Bouvier, with which it was taken at one station, but the chelophore is more slender, and the chela especially is very different (cf. Figs. 9 and 11 *b*); the long setae on the femur are very characteristic.

Distribution. Previously recorded from the South Shetland Islands.

Nymphon hiemale, Hodgson (Figs. 12 *a* and 13 *c*).

Nymphon hiemale, Hodgson, 1907, p. 20, pl. iii, fig. 1; pl. x, fig. 8.
Nymphon hiemale, Bouvier, 1913, p. 73 (in key).
Nymphon hiemale, Calman, 1915, p. 32.
Nymphon hiemale, Loman, 1923, pp. 14 and 16.
? *Nymphon gracillimum*, Calman, 1915, p. 30, Fig. 5 A–D.

St. 27. 15. iii. 26. West Cumberland Bay, South Georgia, 3·3 miles S 45° E of Jason Light, 110 m.; M. R. Large dredge: 4 specimens, including 1 ovigerous ♂.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 2 specimens, 1 overgrown by a large compound Tunicate.

[1] Compare the measurements of the fourth and the first leg; the third is incomplete.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 3 specimens.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point, to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 4 specimens, including 1 ovigerous ♂.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 5 specimens including 1 ovigerous ♂.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 1 specimen.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 5 adult (including 2 ovigerous and 1 larvigerous ♂♂) and 1 immature specimens.

St. 159. 21. i. 27. 53° 52′ 30″ S, 36° 08′ W, 160 m.; R. Large dredge: 2 specimens.

St. 160. 7. ii. 27. Near Shag Rocks, 53° 43′ 40″ S, 40° 57′ W, 177 m.; gy. M. St. R. Large dredge: 3 ♂♂ (1 ovigerous and 1 larvigerous). On the label there is the following note: "Body testaceous. Proboscis with red flecks dorsally. Ill-defined red patches as follows: at either end of basal segment of chelophore: on leg processes of body: on 1st and 3rd leg segments, on 2nd and 4th at proximal end and on 2nd, 4th and 5th in distal third. All legs similarly coloured".

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 1 very small but ovigerous ♂.

Redescription of holotype.[1] *Trunk* with lateral processes separated by approximately their own diameter. Neck long, the oviger base occupying one-third thereof and in contact with first lateral process. Ocular tubercle as high as wide, rounded; eyes well developed.

Proboscis equal to cephalic segment (cf. Calman, 1915, p. 32), subequal to scape, somewhat expanded in middle and again at apex.

Abdomen short, reaching to distal end of fourth lateral process; elevated at an angle of about 25°.

Chelophore. Scape rather longer than chela, length about five times the maximum width. Fingers somewhat longer than palm; approximately thirty-five spinules on movable, twenty-seven on immovable one; setose pad extending nearly one-third along the latter.

Palp with segments 2–5 in the proportions 8 : 7 : 4 : 5.

Oviger. Terminal claw rather more than half of tenth segment, armed with 10–12 spinules; total number of denticulate spines, forty-one.

Third leg. Second coxa two-thirds as long again as the sum of the other two (1·65 : 1, measured dorsally). Femur a little shorter than, second half as long again as, first tibia. Tarsus subequal to propodus (8 : 9), ventral margin of the latter spinose (Fig. 12 *a*). Claw not quite half as long as propodus, auxiliaries well developed.

[1] Female, selected by Calman, 1915, p. 32, in B.M. collection.

Male paratypes, measuring 6·8 and 7·1 mm.[1] in length (trunk only), agree in most respects with the holotype. There are forty-two and forty-three denticulate spines respectively on the four terminal segments of the oviger. The second coxa is longer (1·85 and 1·95 : 1).

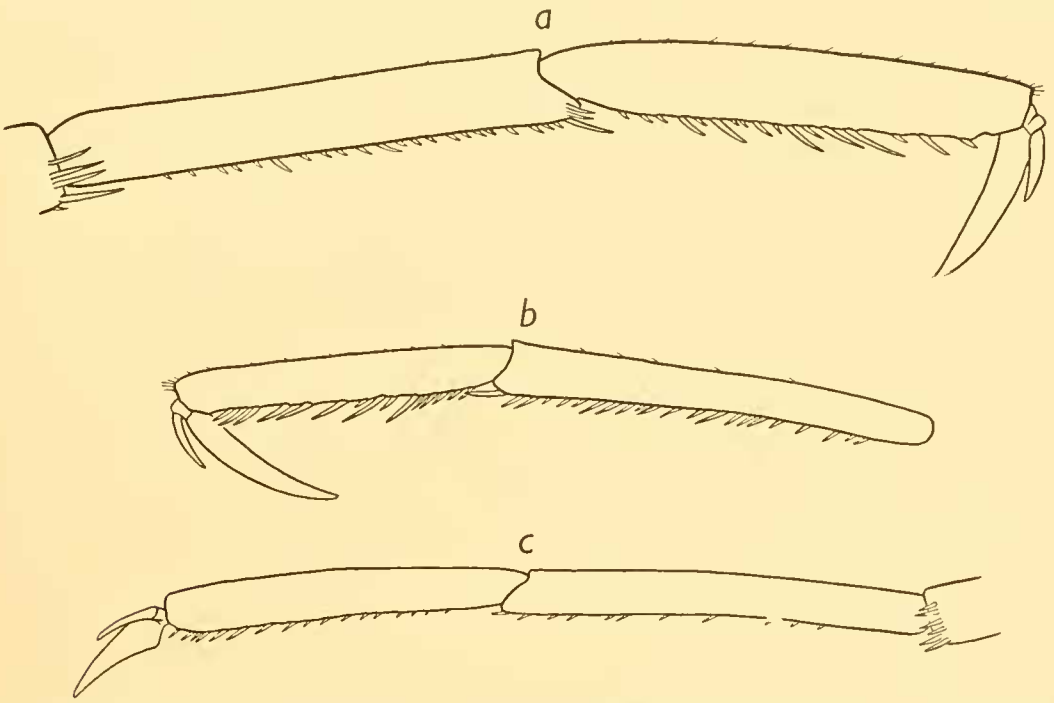

Fig. 12. Terminal segments of third leg of: *a. Nymphon hiemale*, Hodgson, paratype. *b. N. gracillimum*, Calman, holotype. *c. N. gracilipes*, Miers, holotype.

Table IV

	N. hiemale paratypes		Discovery collection							*N. gracillimum*
	♂1	♂2	♂ St. 27	♂ St. 123	♂ St. 160	♂ St. 140	♂1 St. 149	♂2 St. 149	♂3 St. 149	♂ holotype
L. of trunk (in mm.)	6·8	7·2	6·0	6·0	6·0	7·2	6·8	6·4	6·8	4·80
No. of spinules on fingers of chela	30–36		24, 29	27, 33	33, 38	34, 38	36, 40	30, 35	27, 33	22, 24
L. of palpal segments 4+5 / L. of segment 2	1	1·06	0·87	1·05	1·0	1·08	1·02	1·0	0·81	0·85
No. of denticulate spines on oviger	42	43	31	40	38	40	36	36	34	33
Third leg:										
(*a*) L. of coxa 2 / L. of coxae 1+3	1·64	1·95	2	1·80	1·90	2	2·30	1·60	2·2	2·1
(*b*) L. of tarsus / L. of propodus	0·89	1·0	0·83	0·97	1	1·06	1·04	1·16	1·25	1·33

[1] Measurements of holotype in Calman, 1915, p. 32.

On the proximal ventral margin of the femur are 12–16 minute gland openings, on a level with the surface. Segments 4–6 of the oviger are in the proportions 1·6 : 2·8 : 1 (Fig. 13 *c*); the fifth segment is long, slender, slightly curved and narrowed proximally.

Remarks. The holotype of *N. gracillimum*, Calman, is very closely related to, and may even be co-specific with, *N. hiemale*. In the Discovery collection there are many specimens that show characters intermediate between the two species (see Table IV), and one male from St. 149 that agrees very closely with the holotype of *N. gracillimum* (Table IV, St. 149, δ_3). The femoral glands in the latter open on distinct tubercles; in the specimens referred to *N. hiemale* the gland openings are usually flush with the surface, but may be situated on faint, low tubercles.

Distribution. This species has been recorded from the Ross Sea area (Hodgson, 1907; Calman, 1915); it is quite abundant around South Georgia and occurs as far south as Clarence Island.

Nymphon gracillimum, Calman (Figs. 12 *b* and 13 *a*).

Calman, 1915, p. 30, fig. 5 A–D.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 1 ovigerous ♂.

The holotype differs from the types of *N. hiemale*, Hodgson, in the following respects. The proboscis is shorter than the cephalic segment; the two terminal segments of the palp measure 0·85 of the length of the second segment. There are twenty-two and twenty-four spinules respectively on each finger of the chela, and there is only a trace of the setose pad at the proximal end of the immovable finger. The tarsus is one and a third times the length of the propodus and the second coxa is 2·1 times the sum of the other two coxal segments. (The second tibia, as in *N. hiemale*, is nearly 1·5 times as long as the first.) There are thirty-three denticulate spines on the oviger, and the femoral gland openings are not flush with the ventral surface but situated at the apices of distinct low tubercles.

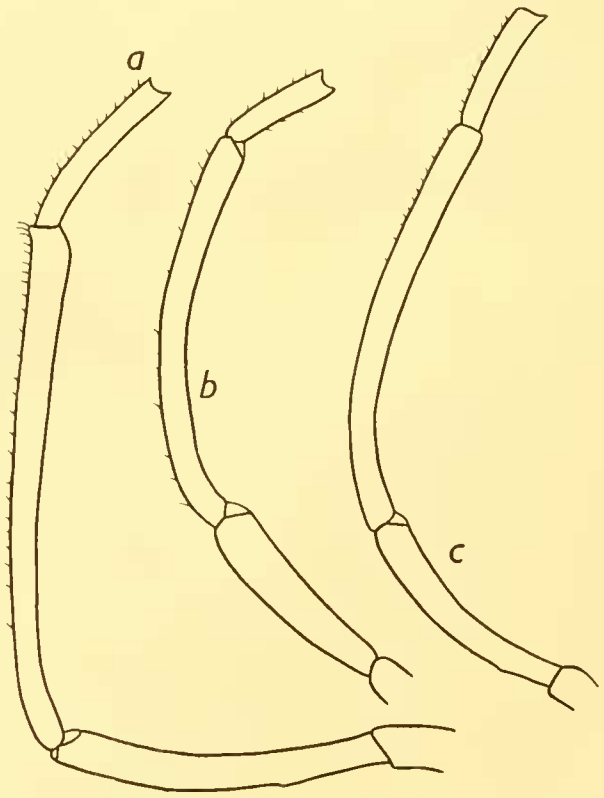

Fig. 13. Segments 4–6 of male oviger of: *a. Nymphon gracillimum*, Calman: × 20. *b. N. gracilipes*, Miers: × 15. *c. N. hiemale*, Hodgson: × 20.

The difference in the number of spines on the oviger may be due to the smaller size of the specimens (4·8 mm. as against 6·8–7·2 mm. in the types of *N. hiemale*).

In the Discovery collection there is one ovigerous male, measuring 6·8 mm. in length, that agrees very closely with the type of *N. gracillimum*. There are only thirty-four denticulate spines on the oviger; the two terminal palpal segments together are four-fifths of the second segment (Table IV, St. 149, ♂3); the second coxa is 2·2 times the sum of the other two coxal segments. The femoral gland tubercles, however, are not quite so prominent as in the type; the tarsus is one-fourth as long again as the propodus. The number of spinules on each finger of the chela is twenty-seven and thirty-three respectively.

Measurements (mm.)

		Third leg:	
Length of proboscis	2·3	First coxa	1·0
Diameter of proboscis	0·8	Second coxa	4·0
Length of trunk	6·8	Third coxa	0·8
Length of cephalic segment	3·2	Femur	8·0
Width of anterior cephalic lobes ...	1·2	First tibia	10·0
Width of neck	0·53	Second tibia	14·5
Width across second lateral processes	3·2	Tarsus	2·0
Length of abdomen	0·7	Propodus	1·6
		Claw	0·8
		Auxiliaries	0·2

Distribution. Previously recorded from McMurdo Sound.

Nymphon subtile, Loman (Figs. 14, 15 and 24 *b*).

Loman, 1923, pp. 14 and 19, fig. C.

St. 51. 4. v. 26. Off Eddystone Rock, East Falkland Island, from 7 miles N 50° E to 7·6 miles N 63° E of Eddystone Rock, 105–115 m.; f. S. Large otter trawl: 1 ♀ from kelp root.

St. WS 229. 1. vii. 28. 50° 35′ S, 57° 20′ W, 210–271 m.; f. gn. S. Commercial otter trawl: 2 ovigerous ♂♂, 2 young, with *Pallene australis*, n.sp.

St. WS 237. 7. vii. 28. 46° 00′ S, 60° 05′ W, 150–256 m.; c. br. S. Sh. Commercial otter trawl: 1 ♀, 1 ovigerous ♂.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 1 ♀, 1 incomplete specimen.

Description of male. *Trunk* loosely built, lateral processes separated by wide intervals (one and a half to two and a half times their own diameter). Cephalic segment approximately equal to the sum of the three posterior segments; neck long; oviger base small and in contact with first lateral process. Ocular tubercle wide, low and rounded; eyes conspicuous. Setae absent (Fig. 15 *a*).

Proboscis short, sub-cylindrical; nearly equal to, though apparently much shorter than, scape (from dorsal aspect); foreshortened in Fig. 15 *a*.

Abdomen short, reaching to distal end of fourth lateral process or a little beyond; elevated at an angle of about 35°.

Chelophore. Scape shorter than chela, length four and a half times the distal width. Fingers rather longer than palm each armed with eighteen and twenty-two spinules respectively (Fig. 14 *b*).

Palp. Third segment four-fifths of, two terminal segments together equal to, second (Fig. 14 *c*).

Oviger. Terminal claw approximately half of tenth segment, armed with five spinules. Total number of denticulate spines 32 (9 + 8 + 7 + 8). Segments 4–6 in the proportions 1·5 : 2·5 : 1; fifth segment long, curved, and of almost uniform diameter throughout (Fig. 14 *a*).

Third leg slender and sparsely setose. Second coxa longer than the sum of the other two (dorsal measurements—1·5–1·75 : 1). Femur shorter than either tibia; there appear to be 8–9 minute gland openings on proximal two-thirds of mid-ventral surface but no raised tubercles. Second tibia the longest segment. Tarsus half to two-thirds of propodus; claw short, about one-third of propodus, auxiliaries well developed (half to two-thirds of main claw). Numerous small spinose setae on ventral margin of tarsus and of propodus (Fig. 24 *b*).

Female. The femur and second coxa are more robust and segments 4–6 of the oviger are relatively short and almost straight, in the proportions 1·88 : 2·25 : 1. The second coxa is never more than half as long again as the sum of the other two.

Measurements (*mm.*)

	♂ (WS 237)	♀ (WS 245)
Length of proboscis	0·6	0·85
Diameter of proboscis	0·4	0·47
Length of trunk	2·4	2·6
Length of cephalic segment	1·2	1·25
Width of cephalic lobes	0·6	0·6
Width of neck	0·25	0·27
Width across second lateral processes	1·6	1·4
Length of abdomen	0·4	0·35
Third leg:		
First coxa	0·4	0·4
Second coxa	1·3	1·0
Third coxa	0·35	0·3
Femur	2·5	2·4
First tibia	2·9	2·7
Second tibia	3·75	3·4
Tarsus	0·7	0·5
Propodus	1·1	1·0
Claw	0·35	0·34
Auxiliaries	0·25	0·2

Remarks. These specimens agree closely with Loman's description (1923, p. 19) of the holotype, an ovigerous male. The number of denticulate spines on the oviger varies from twenty-four to thirty-six, the number of spinules on the fingers of the chela from fourteen to twenty-four.

This species is most closely allied to *N. pfefferi*, Loman, and *N. paucidens*, n.sp. (especially to the former), but differs from both in that the neck is longer and the number of denticulate spines is higher. *N. adareanum*, Hodgson, has the same type of male oviger (see Table III), but it differs from all other *Nymphon* species in having simple spines on the four terminal segments (see Gordon, 1932, p. 98).

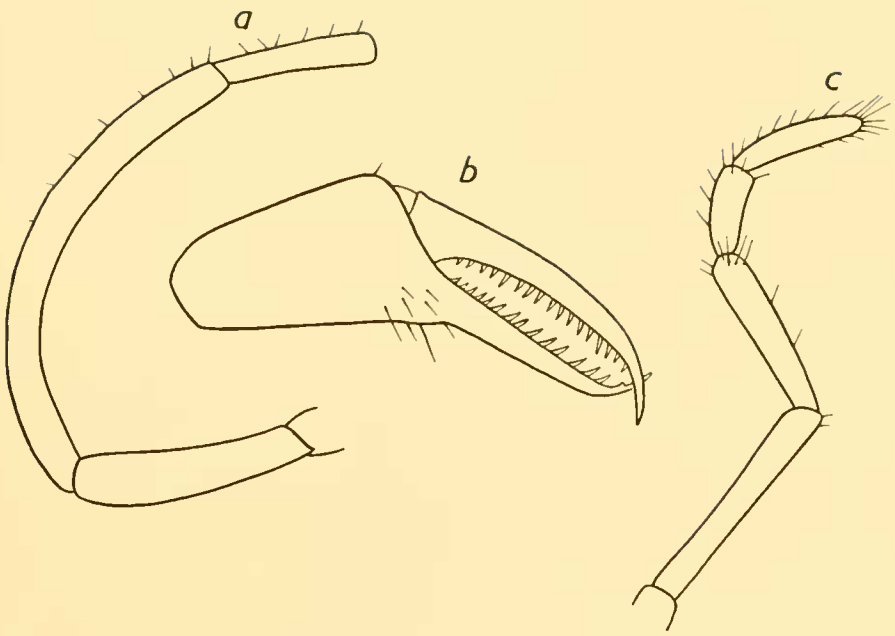

Fig. 14. *Nymphon subtile*, Loman: *a*. Segments 4–6 of male oviger. *b*. Chela. *c*. Palp.

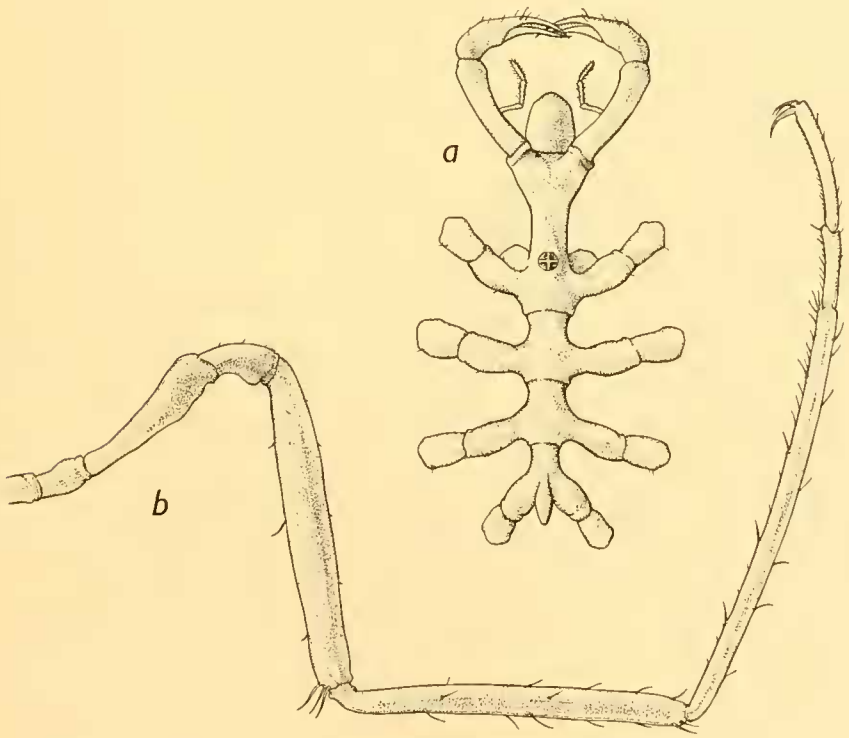

Fig. 15. *Nymphon subtile*, Loman: *a*. Dorsal view of body with chelophores and palps—proboscis fore-shortened. *b*. Third leg of female from St. 51.

Nymphon pfefferi (Pfeffer), Loman (Figs. 16, 17 *b*, *d* and 18 *a*, *b*, *d*).

N. antarcticum, Pfeffer, 1889, *Jahrb. Hamburg Wiss. Anst.*, VI, Heft 2, p. 42.

N. pfefferi, n.n., Loman, 1923, p. 17, fig. B.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point, to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 2 immature specimens.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 6 specimens.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia, 200 yards from shore, under Mount Duse, 17–27 m.; M. Small beam trawl: 1 ♂.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 1 ♀.

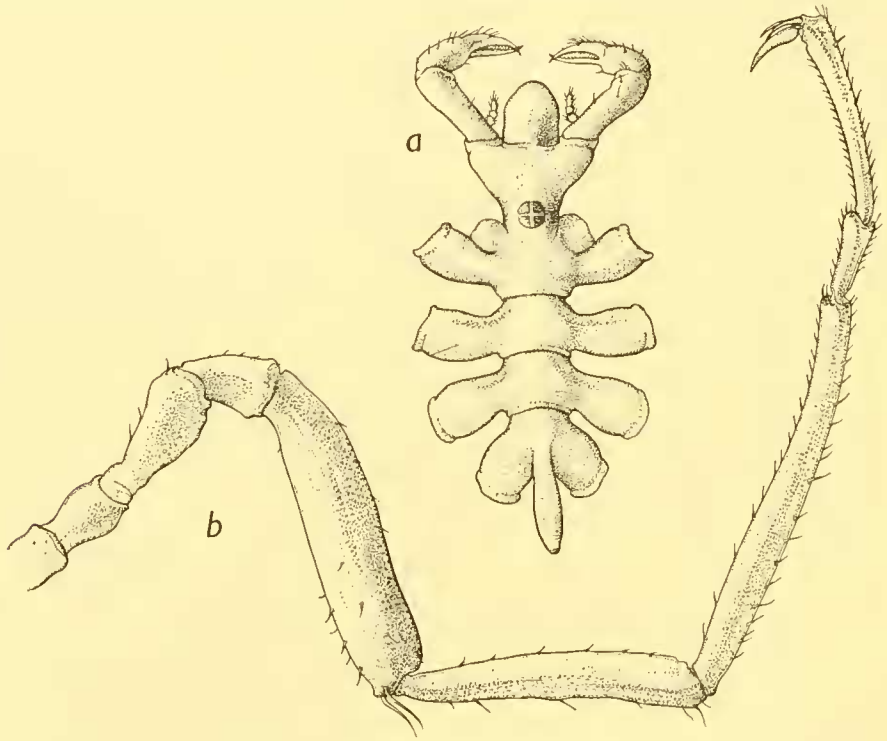

Fig. 16. *Nymphon pfefferi*, Loman: *a*. Dorsal view of body of male from St. 141, with chelophores and palps: × 40. *b*. Third leg of female from St. 149.

Description of male. *Trunk* with lateral processes separated by their own diameter as a rule. Neck short, almost entirely occupied laterally by the base of the oviger; cephalon much expanded anteriorly. Ocular tubercle low, wide, rounded; eyes conspicuous. Setae absent (Fig. 16 *a*).

Proboscis short; subequal to, or shorter than scape, and half to three-fifths of cephalic segment.

Abdomen long, slender; reaching to distal end of first coxa; elevated at an angle of about 30°.

Chelophore. Scape short, length two and a half to three times the distal width. Chela subequal to scape; fingers one-third as long again as palm armed each with 19–30 spinules; setose pad extending half-way along immovable finger (Fig. 17 *b* and *d*).

Palp. Terminal longer than penultimate segment, both setose (Fig. 18 *b*). Two terminal segments together equal to third, and a little shorter than second segment.

Oviger. Terminal claw equal to tenth segment and armed with 5–7 spinules. Total number of denticulate spines 19–22. Segments 4–6 in the proportions 1·3 : 1·73 : 1 (Fig. 18 *a*); fifth segment curved and of almost uniform diameter throughout.

Third leg. Second coxa a little longer than the sum of the other two. Femur slightly shorter than first tibia; four low wide gland tubercles on proximal half of ventral margin. Second tibia the longest segment. Tarsus short, approximately one-third of propodus; claw short; auxiliaries long ($\frac{1}{2}$–$\frac{3}{4}$ of claw). A number of rather long setae on coxae, femur and first tibia, those on the distal segments shorter and more numerous.

Female. The femur is more robust, the coxae less setose and segments 4–6 of oviger relatively short and straight (1·33 : 1·33 : 1).

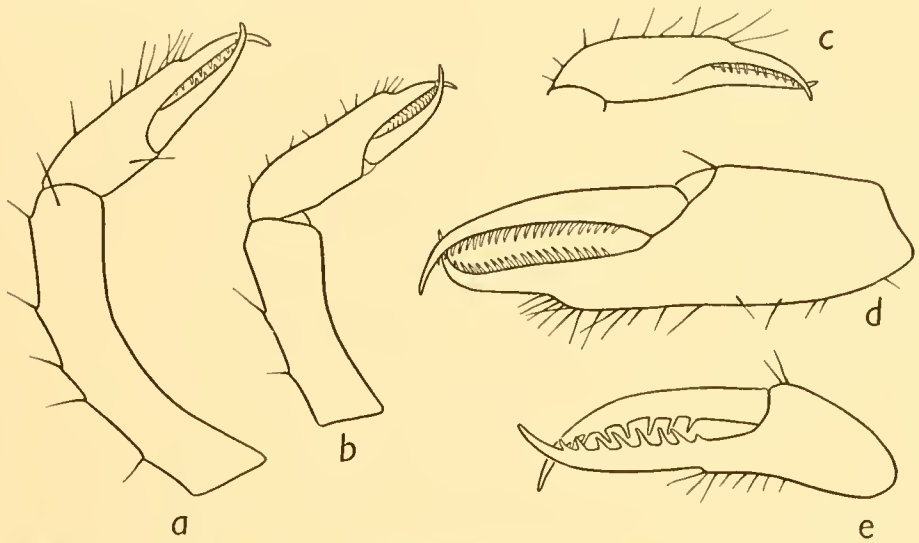

Fig. 17. *Nymphon pfefferi*, Loman: *b*. Chelophore of young specimen (length = 1·4 mm.). *d*. Chela of adult co-type.

N. paucidens, n.sp.: *a*. Chelophore of young specimen (length = 1·8 mm.). *e*. Chela of adult: × 60.

N. tridentatum, Hodgson: *c*. Chela of holotype (young).

Measurements (mm.)

	♂ (St. 141)	♀ (St. 149)
Length of proboscis	0·5	0·87
Diameter of proboscis	0·35	0·45
Length of trunk	2·0	2·2
Length of cephalic segment	1·0	1·0
Width of cephalic lobes	0·8	0·9
Width across second lateral processes	1·65	1·65
Length of abdomen	0·8	0·85
Third leg:		
Coxae	1·8	1·8
Femur	1·95	2·1
First tibia	2·2	2·2
Second tibia	2·8	2·8
Tarsus	0·45	0·45
Propodus	1·35	1·37
Claw	0·4	0·5
Auxiliaries	0·3	0·3

Remarks. This small species has only once been figured, and that rather poorly, by Loman (1923, fig. B). The Discovery specimens agree well with co-types in the Hamburg Museum. The proboscis varies considerably in relative length (e.g. the trunk is four times as long as the proboscis in the male, and only two and a half times in the female measured), and may be rather longer or shorter than the scape.

The differences between this species and *N. paucidens* are listed on p. 51, and illustrated in Figs. 16–20.

Loman (1923, p. 18) suggested that *N. tridentatum*, Hodgson, may be a young specimen of *N. pfefferi*. This is very probable; the chelophore is of the same type with eleven spinules on the immovable, twelve or thirteen on the movable finger (Fig. 17 *c*); the ratio of tarsus to propodus is about the same (Fig. 18 *c*) and the proportions of the palpal segments are very similar. The specimen is very immature, the total[1] length being only 1 mm.; it has a longer neck and longer setae on the distal segments of the legs than are typical of adult specimens of *N. pfefferi*.

Nymphon paucidens, n.sp. (Figs. 17 *a*, *e*, 19 and 20).

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 1 ♂, holotype.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point, to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 2 ♂♂, 1 ♀, 2 immature specimens.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 ♀ and 3 immature specimens.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 2 ♂♂, one carrying two egg-masses on the left oviger.

St. MS 74. 17. iii. 26. East Cumberland Bay, 1 cable SE × E of Hope Point to 3·1 miles SW of Merton Rock, 22–40 m. Small beam trawl: 1 immature specimen.

Description of holotype (♂). *Trunk* with lateral processes separated by their own diameter or rather more. Cephalic segment approximately equal to the sum of the three posterior segments; neck short, base of oviger in contact with first lateral process and occupying posterior half of neck (Fig. 19 *a*). Ocular tubercle rather higher than wide, rounded; situated a little in front of first lateral processes.

Proboscis sub-cylindrical, rounded at apex; two-thirds of cephalic segment (dorsal aspect).

Abdomen long, narrow, pyriform; extending a little beyond distal end of first coxa; elevated at an angle of about 40°.

Palp setose. Second segment somewhat longer than, two terminal segments together equal to, third (Fig. 20 *b*).

[1] I.e. including proboscis and abdomen.

Chelophore. Scape longer than proboscis, length nearly six times the distal width. Chela a little shorter than scape; palm very short; each finger armed with only 7–9 long spinules (Fig. 17 *a*, *e*).

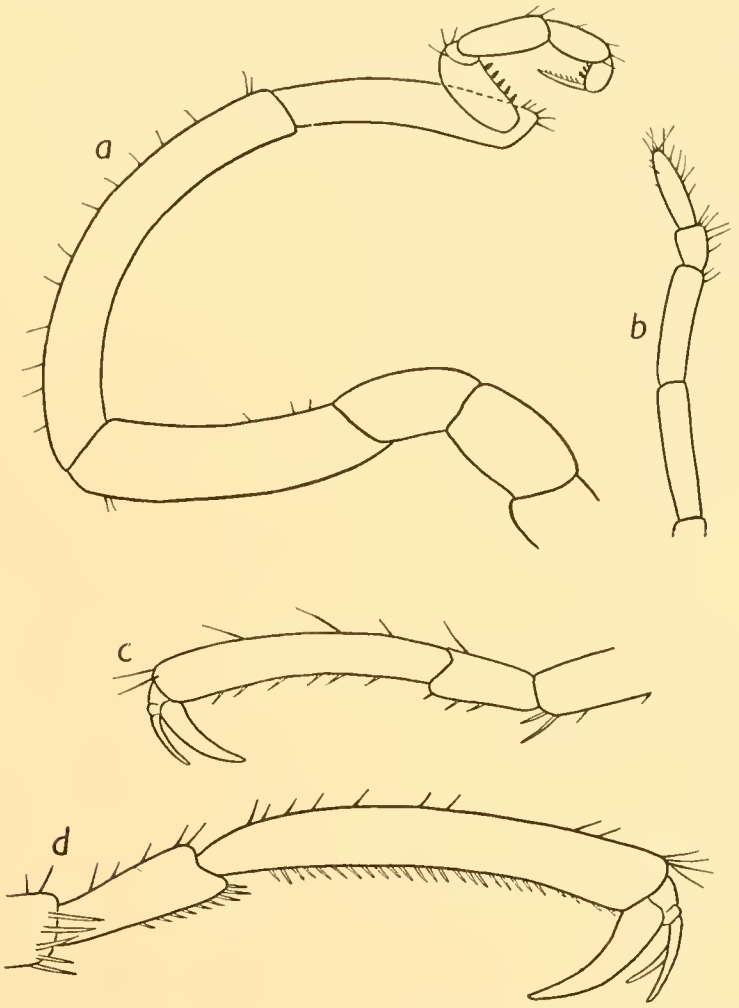

Fig. 18. *Nymphon pfefferi*, Loman: *a*. Oviger of male from St. 141: × 70. *b*. Palp of a rather small specimen from St. 140: × 90. *d*. Terminal segments of third leg of a co-type. *N. tridentatum*, Hodgson: *c*. Terminal segments of fourth leg of holotype.

Oviger. Terminal claw equal to tenth segment armed with five long, slender spinules. Total number of denticulate spines 17–20. Segments 4–6 in the proportions 2·2 : 2·87 : 1, fifth segment slender, curved, and of almost uniform diameter throughout.

Third leg slender, with numerous long, fine setae, especially on the three longest segments. Second coxa a little longer than the sum of the other two. Femur shorter than either tibia; four low wide gland tubercles on proximal half of ventral surface. Second tibia the longest segment. Tarsus half of propodus; auxiliaries half as long as main claw (Fig. 20, cf. 19 *b*).

The *female* has the walking legs, especially as regards the femur, a little more robust

(Fig. 19 *b*). Segments 4–6 of the oviger are straight and relatively short, in the proportions 1·75 : 1·5 : 1. Otherwise it agrees with the male.

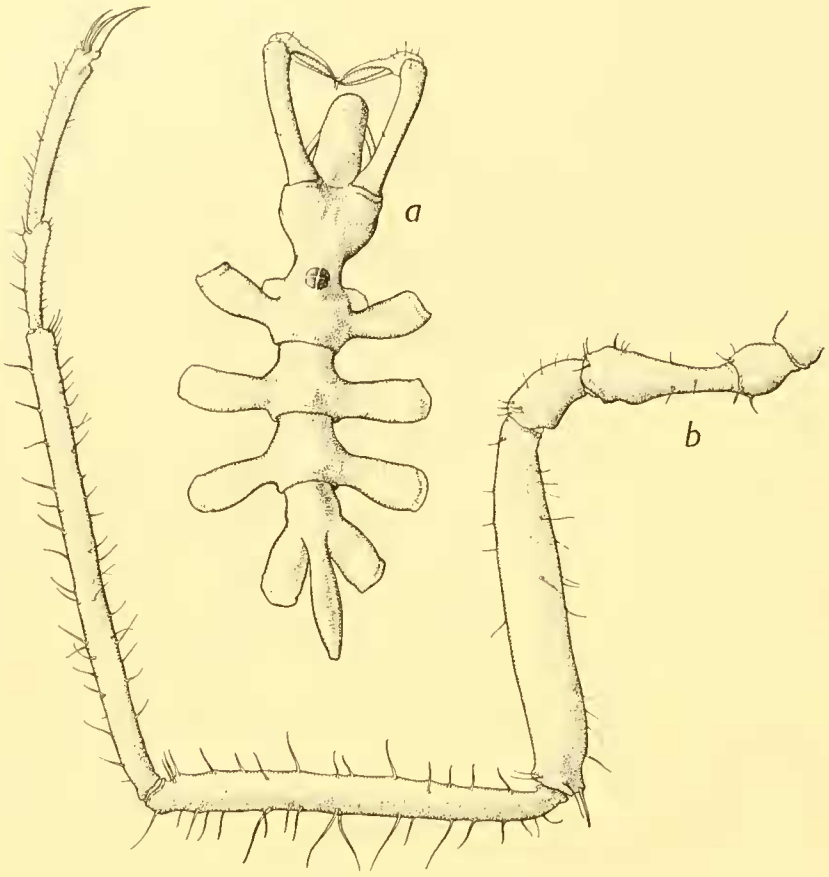

Fig. 19. *Nymphon paucidens*, n.sp. *a*. Dorsal view of body of holotype with chelophores: × 20—proboscis foreshortened. *b*. Third leg of female from St. 140.

Measurements (mm.)

	♂ holotype	♀ (St. 140)
Length of proboscis	0·7	0·8
Diameter of proboscis	0·35	0·37
Length of trunk	2·4	2·5
Length of cephalic segment	1·1	1·2
Width of cephalic lobes	0·7	0·75
Width across second lateral processes	1·6	1·6
Length of abdomen	0·85	1·0
Third leg		
Coxae	2·0	1·9
Femur	2·4	2·5
First tibia	2·8	2·8
Second tibia	3·4	3·2
Tarsus	0·6	0·6
Propodus	1·2	1·3
Claw	0·45	0·45
Auxiliaries	0·25	0·25

Remarks. This small species may be distinguished from *N. pfefferi*, Loman, with which it occurred in two localities, as follows. (1) The trunk is less compact and the cephalon less expanded anteriorly (cf. Figs. 16 *a* and 19 *a*). (2) The legs are more slender and setose (cf. Figs. 16 *b* and 19 *b*) and the tarsus is consistently longer in proportion to the propodus (one-half and one-third respectively). (3) The scape of the chelophore is longer and more slender (cf. Fig. 17 *a* and *b*); the palm is much shorter and there are fewer spinules on the fingers of the chela (cf. Fig. 17 *e* and *d*). Even in very small specimens these differences are apparent, and when the trunk length is only 1·4 mm. there are already 15–16 spinules on the fingers of the chela in *N. pfefferi* (Fig. 17 *a*, cf. Fig. 17 *b*). (4) The male oviger is more slender and segment 6 is relatively short—half as long as, instead of subequal to, segment 4 (Figs. 20 *a* and 18 *a*).

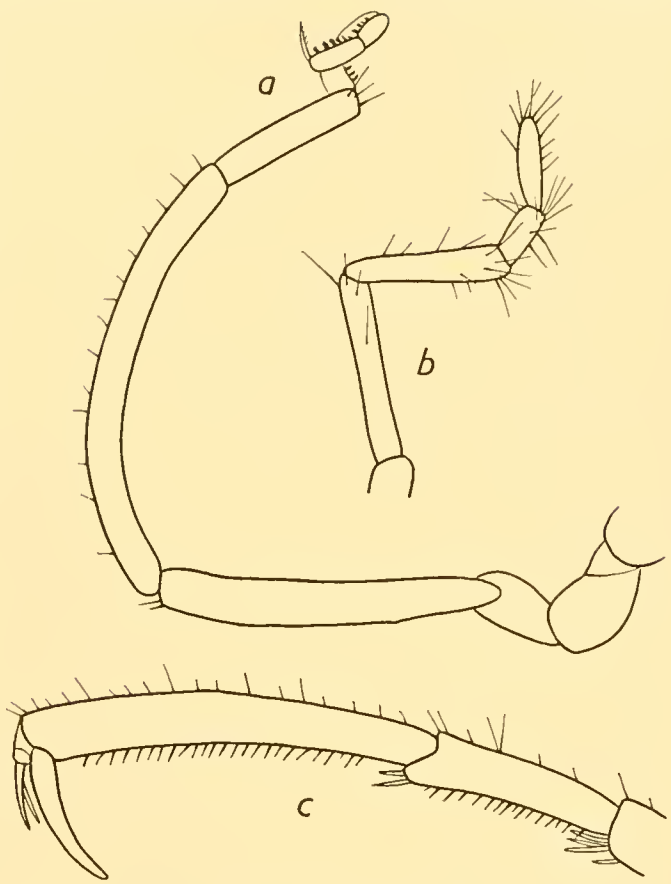

Fig. 20. *Nymphon paucidens*, n.sp.: *a*. Oviger of holotype: × 47. *b*. Palp of holotype: × 60. *c*. Terminal segments of third leg of female: × 47.

Nymphon charcoti, Bouvier (Fig. 10 *b*).

N. charcoti, Bouvier, 1911, p. 1138; 1913, p. 81, text-figs. 32–34.
N. charcoti, Calman, 1915, p. 29.
N. charcoti, Loman, 1923, p. 15.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 17 specimens, including ovigerous and larvigerous ♂♂, several with encrusting Polyzoa.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light, to 4 miles N 39° E of Jason Light, 120–204 m., M. Large otter trawl: 7 large (1 with encrusting Polyzoa) and many small specimens.

St. 45. 6. iv. 26. 2·7 miles S 85° E of Jason Light, South Georgia, 238–270 m.; gy. M. Large otter trawl: many specimens of all sizes, some males larvigerous, a few with encrusting Polyzoa (with *N. australe*). A number of the smaller specimens are soft.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 1 ♂, 3 ♀♀ and several immature specimens.

St. 142. 30. xii. 26. East Cumberland Bay, South Georgia, from 54° 11′ 30″ S, 36° 35′ W to 54° 12′ S, 36° 29′ 30″ W, 88–273 m., M. Large otter trawl: 3 specimens, 1 ovigerous, 1 overgrown with Hydroids, the third very soft.

St. 143. 30. xii. 26. Off mouth of East Cumberland Bay, South Georgia, 54° 12′ S, 36° 29′ 30″ W, 273 m. Large otter trawl: 2 ♀♀, 1 ♂ (ovigerous and with 1 large and several small Isopods attached), 1 immature.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 1 ♂ (soft).

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, from 1·15 miles N 76½° W to 2·62 miles S 11° W of Merton Rock, 200–234 m.; M. Large otter trawl: 1 ♀ and 4 immature specimens.

St. 154. 18. i. 27. Jason Harbour to Larsen Point, South Georgia, from 2·6 miles S 84° W to 5½ cables S 26° E of Larsen Point, 60–160 m.; M. Large dredge: several adult and immature specimens, including 1 ovigerous ♂.

St. 156. 20. i. 27. 53° 51′ S, 36° 21′ 30″ W, 200–236 m.; R. Large dredge: 1 ♂, 1 ♀ (claw short).

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 2 specimens, 1 very flabby (claw short).

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: at least a hundred specimens of all sizes.

St. WS 32. 21. xii. 26. Mouth of Drygalski Fjord, South Georgia, 91–225 m.; gy. M. Small beam trawl: 1 ♀.

St. MS 68. 2. iii. 25. East Cumberland Bay, South Georgia, 1·7 miles S ½ E to 8½ cables SE × E of Sappho Point, 220–247 m. Large rectangular net: many specimens of all sizes including ovigerous and larvigerous ♂♂, one is overgrown with a compound Tunicate and Hydroids, one has an Isopod attached.

Description of male. *Trunk* with lateral processes separated by a considerable interval (0·6–1·5 of their own diameter). Neck rather long, base of oviger large and in contact with, or a little in front of, first lateral process. Ocular tubercle as wide as, or even wider than high; eyes conspicuous.

Proboscis expanded somewhat in middle and again at apex; subequal to scape and slightly shorter than cephalic segment.

Abdomen short, scarcely reaching to distal end of fourth lateral process, elevated at an angle of about 30°.

Chelophore. Scape shorter than the curved chela, length four and a half times the distal width, bearing a number of short, stout setae. Palm long, narrow, and provided with a number of short setae along mid-dorsal surface. Fingers rather longer than, and at an angle of about 45° to, palm; 65–90 crowded spinules on immovable, 75–110 on movable finger.

Palp long and slender; segments 2–5 subequal; in the proportions 10 : 10 : 11 : 10 and 12 : 14 : 13 : 14·5.

Oviger. Terminal claw a little more than half of tenth segment and armed with 10–16 long spinules. Total number of denticulate spines in adults 40–51. Segments 4–6 in the proportions 1 : 1·71 : 1; fifth segment slightly curved and contracted in proximal third, sixth segment bent in a very open S curve (Fig. 73).

Third leg. Second coxa a little longer than the sum of the other two. Femur shorter than either tibia; gland openings very minute, and numerous (exceeding twenty in the larger males) on proximal mid-ventral surface; raised gland tubercles absent. Second tibia the longest segment. Tarsus and propodus elongated, subequal; in adults the tarsus is longer than, in immature forms a little shorter than the propodus (see Table V). Claw long, subequal to propodus in immature specimens, appreciably shorter than, occasionally less than half of, propodus in adults (see Table V); auxiliaries absent. The legs, as a rule, appear smooth or very slightly setose to the eye.

Table V

Station	Sex	Relative lengths of		
		Tarsus	Propodus	Claw
MS 68	♂	1·38	1	0·81
39	♂	1·33	1	0·71
143	♀	1·28	1	0·72
156	♀	1·40	1	0·58
170	♀	1·23	1	0·44
195	♂	1·17	1	0·68
195	♀	1·30	1	0·74
195	Immature*	1·03	1	0·88
195	,,	0·96	1	1·06
195	,,	0·85	1	1·03
195	,,	0·84	1	1·03

* The immature forms decrease gradually in size, the last measures only 4·4 mm. from front of cephalon to tip of abdomen, the first is approximately twice as long.

Remarks. This species is exceedingly common on the western side of the Antarctic and is also one of the largest of the genus (trunk length up to 18·5 mm.). The Discovery specimens agree in most respects with Bouvier's description (1913, p. 81); but the femur of the male is similar to that of the female, not dilated (see Calman, 1915, p. 29).

Very few specimens have been collected on the eastern side. The three Terra Nova specimens from St. 294 (Calman, 1915, p. 29) differ from the Discovery specimens of the same size (length of trunk 12–13 mm.) in the following respects: (1) the legs are clothed with numerous fine setae, (2) there are only 30 or 31, instead of 41–44 denticulate spines on the oviger, and (3) the fingers of the chela are armed with 70–85 instead of 90–110 spinules. These three specimens are closely related to, if not identical with, the types of *N. lanare*, Hodgson (see also Loman, 1923, p. 15). Unfortunately the type specimens of Hodgson's species are immature, but they differ from immature *N. charcoti* (South Georgia region) precisely in the three above-mentioned respects. These differences seemed to point to the existence of a distinct variety or race peculiar to the Ross Sea area, but the Terra Nova specimen from St. 349 proved to be identical with the typical *N. charcoti* from the Western Antarctic region. Until more material is available from the eastern region it seems advisable to refer the three Terra Nova specimens (St. 249) to *N. lanare*, Hodgson, and to retain the name *N. lanare* for those specimens that have 10–13 fewer denticulate spines on the oviger, 20–25 fewer spinules on each finger of the chela, and more hairy legs than *N. charcoti*.

DISTRIBUTION. Previously recorded from South Shetlands, Southern Chili, Ross Sea and McMurdo Sound; South Georgia.

Nymphon clarencei, n.sp. (Figs. 21, 22 and 23 *b*).

St. 160. 7. ii. 27. Near Shag Rocks, 53° 43′ 40″ S, 40° 57′ 00″ W, 177 m.; gy. M. R. St. Large dredge: 1 ovigerous ♂.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ 00″ W, 342 m.; R. Large dredge: 1 ♀, 1 ♂ (holotype), 1 ovigerous ♂ with encrusting Polyzoa and 1 larvigerous ♂.

St. WS 27. 19. xii. 26. 53° 55′ S, 38° 01′ W, 1 metre horizontal tow-net, 106–9 m. (net touched bottom): 1 ♂, 1 ♀, 1 immature specimen.

DESCRIPTION OF HOLOTYPE. *Trunk* with lateral processes separated by considerable intervals (one-third of, to approximately their own diameter). Neck rather short, posterior half bearing the large base of the oviger; ocular tubercle as wide as high; eyes conspicuous (Fig. 21).

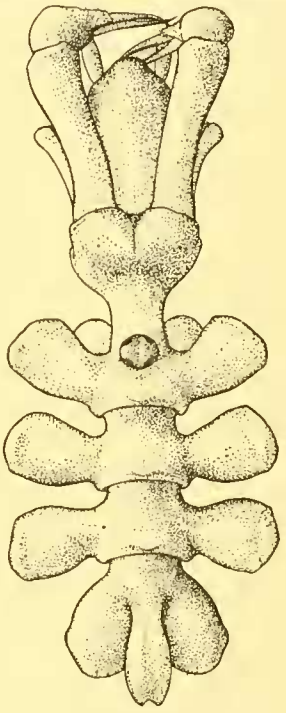

Fig. 21. *Nymphon clarencei*, n.sp. Dorsal view of body with chelophores and palps: × 8.

Proboscis short, stout, sub-cylindrical; three-fourths of cephalic segment, subequal to scape.

Abdomen short, reaching to distal end of fourth lateral process; elevated at an angle of about 30°.

Chelophore. Scape gradually widening distally; length three and a half times the maximum width. Chela equal to (or slightly longer than) scape; fingers slightly longer than palm, armed with thirty-two and thirty-seven spinules respectively, setose pad extending on to proximal fourth of immovable one (Fig. 22 *b*).

Segments 2–5 of *palp* in the proportions 7·66 : 8·33 : 4 : 6; in another ♂ 8 : 8 : 4 : 5 (Fig. 22 *c*).

Oviger. Terminal claw a little shorter than tenth segment and armed with seven spinules. Total number of denticulate spines 35 (13 + 8 + 7 + 7). Segments 4–6 in the proportions[1] 1·78 : 3·11 : 1; fifth segment long, slender and somewhat clubbed distally; sixth segment slightly curved (Fig. 23 *b*).

Third leg. Second coxa long, twice the sum of the other two. Femur slightly shorter than first tibia, 10–11 gland openings, flush with surface, on the proximal mid-ventral surface. Second tibia the longest segment, approximately half as long again as femur. Tarsus two-thirds of propodus, 6–9 long spines on the ventral margin of the latter. Claw nearly half of propodus; auxiliaries well developed (Fig. 22 *a*).

Paratypes. The males all agree very closely with the holotype. In the female the coxae, femur and first tibia of the walking legs are more robust; the second coxa is considerably shorter, less than half as long again as the sum of the other two

[1] 1·6 : 2·8 : 1 in the male from St. WS 27.

(1·24–1·40 : 1); segments 4–6 of the oviger are relatively short, in the proportions 1·31 : 1·75 : 1.

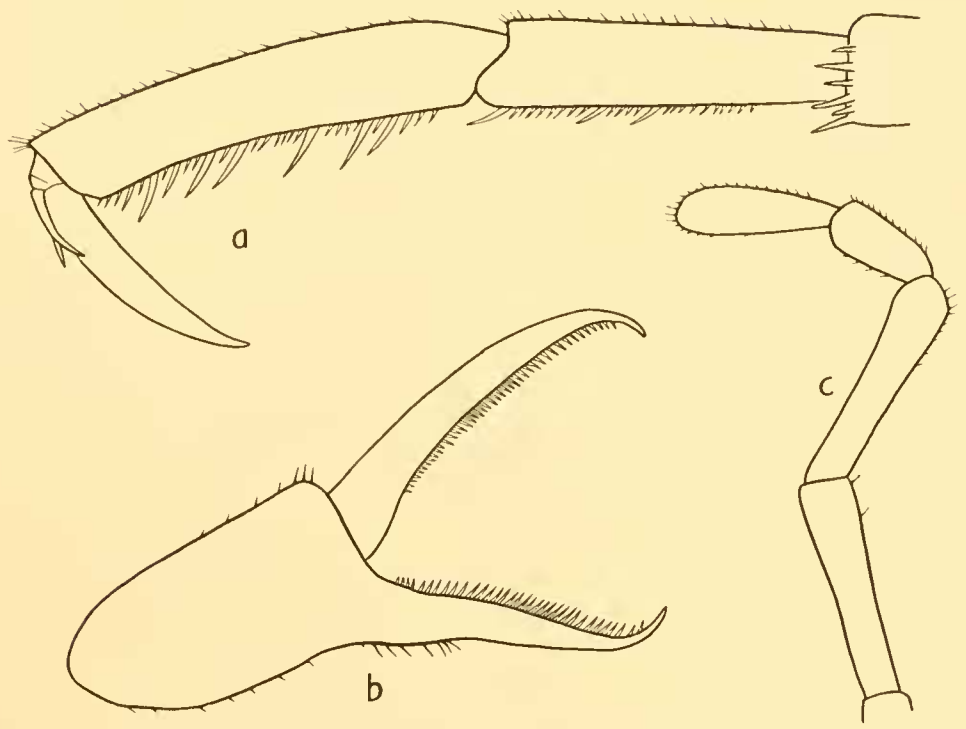

Fig. 22. *Nymphon clarencei*, n.sp.: *a*. Terminal segments of third leg: × 27. *b*. Chela: × 27. *c*. Palp: × 20.

Measurements (mm.)

	Holotype St. 170	Ovig. ♂ St. 170	♀ St. 170
Length of proboscis	2·4	2·2	2·4
Diameter of proboscis	1·2	1·2	1·2
Length of trunk	6·8	6·4	6·4
Length of cephalic segment ...	3·4	3·2	3·2
Width of anterior cephalic lobes ...	1·8	1·8	2·13
Width of neck	0·8	0·9	0·8
Width across second lateral processes	4·0	4·2	4·0
Length of abdomen	1·05	1·0	1·2
Third leg:			
First coxa	1·2	1·2	1·3
Second coxa	4·0	4·0	2·6
Third coxa	0·8	0·8	0·8
Femur	8·4	7·8	8·0
First tibia	9·0	8·65	8·6
Second tibia	13·2	11·4	11·6
Tarsus	1·7	1·4	1·6
Propodus	2·5	2·25	2·5
Claw	1·05	1·0	1·3
Auxiliaries	0·4	0·4	0·4
No. of denticulate spines on oviger...	35	40	37
Approximate no. of spinules on chela	32 and 37	30 and 35	35 and 43

Remarks. This species bears a strong superficial resemblance to *N. hiemale*, Hodgson, but in addition to being a more robust form, it differs from the latter in the following respects: (1) the third palpal segment is equal to or a little longer than the second, (2) the tarsus never exceeds two-thirds of the propodus, (3) the fifth segment of the male oviger, though long, is expanded distally and is very similar to that of *N. brachyrhynchum*, Hoek (Gordon, 1932, fig. 4 *a*). It is easily distinguished from the latter as follows: (1) the chela is subequal to, instead of half as long again as, the scape; the fingers are not bent distally and are armed with fewer spinules (cf. Fig. 22 *b* with Gordon, 1932, fig. 3); (2) the relative proportions of palpal segments 2–5 differ markedly in the two species (e.g. 7·66 : 8·33 : 4 : 6 and in *N. brachyrhynchum* 8 : 11 : 12 : 8); (3) the relative proportions[1] of segments 4–6 of the male oviger are different.

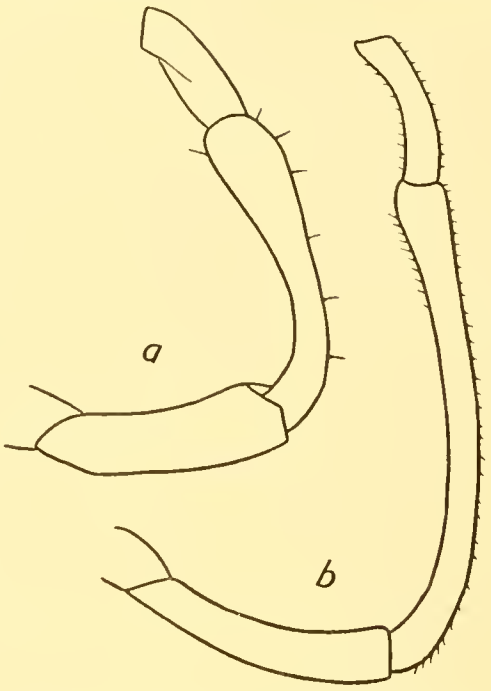

Fig. 23. Segments 4–6 of male oviger of: *a. Nymphon articulare*, Hodgson (sixth segment slightly twisted): × 36. *b. N. clarencei*, n.sp.: × 10.

Nymphon, sp.? (Fig. 24 *e*, *f*).

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; M. Large otter trawl: 1 ♂, incomplete.

Description of specimen. *Trunk* slender, smooth and of very loose build; lateral processes separated by 2–3 times their own diameter. Neck long and slender; ocular tubercle low, as wide as high; eyes conspicuous.

Proboscis long, rather slender, slightly expanded in middle and again near the distal end; approximately two-thirds of cephalon and a little shorter than scape.

Abdomen very short, reaching only to about the middle of fourth lateral process; elevated at an angle of about 45°.

Chelophore long and slender. Scape approximately seven times as long as wide distally, bearing a very few short setae especially near the distal articulation. Chela rather longer than scape (5 : 4) and slightly curved; fingers half as long again as palm, each armed with about 50–52 crowded and uneven spinules (every 2nd–4th spinule long, the intermediate ones of various lengths). Setose pad scarcely developed (Fig. 24 *f*).

Palp long and slender, segments 2–5 subequal in the proportions 4·25 : 4·5 : 4·5 : 4·75; setae very minute.

[1] In *N. brachyrhynchum* 2·5 : 4 : 1 and 2·33 : 3·66 : 1.

Oviger long and slender. Terminal claw three-fifths of tenth segment and armed with 7–8 spinules. Total number of denticulate spines 30 (12 + 7 + 5 + 6). Segments 4–6 in the proportions 1·33 : 2 : 1; segment 6 long and slightly curved (Fig. 24 *e*).

Leg. Only the two anterior pairs of legs are complete. The second coxa is long, 1·66 and 2 times the sum of the first and third (see measurements). The femur is shorter than either tibia, with a row of about twenty-four very low, crowded gland tubercles on the proximal two-thirds. Second tibia the longest segment. Tarsus propodus and claw elongated and slender; claw equal to or a little shorter than the propodus which is approximately *half* of the tarsus. Auxiliaries absent.

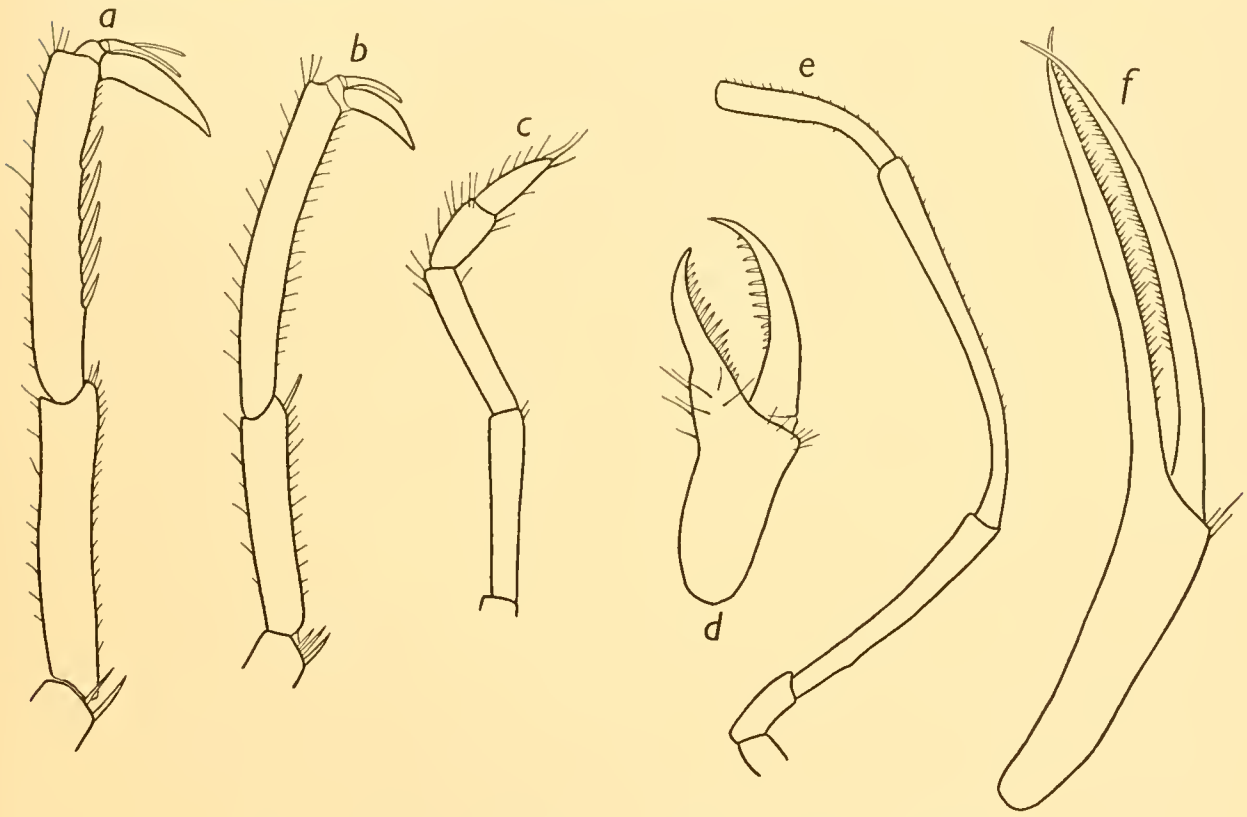

Fig. 24. *Nymphon subtile*, Loman: *b*. Terminal segments of third leg.
Nymphon sp.? St. 53: *a*. Terminal segments of third leg: × 47. *c*. Palp: × 60. *d*. Chela: × 47.
Nymphon sp.? St. 181: *e*. Segments 2–6 of male oviger: × 16. *f*. Chela: × 16.

Measurements (mm.)

		Walking leg:	(1st)	(2nd)
Length of proboscis	2·4	First coxa	1·2	1·2
Diameter of proboscis	0·8	Second coxa	3·0	3·6
Length of trunk	6·93	Third coxa	0·6	0·6
Length of cephalic segment	3·4	Femur	8·8	
Width of anterior cephalic lobes ...	1·22	First tibia	10·4	
Width of neck	0·43	Second tibia	13·0	
Width across second lateral processes	3·6	Tarsus	4·2	3·73
Length of abdomen	0·65	Propodus	2·1	2·0
		Claw	1·87	2·0

Remarks. This species belongs to group I, but the oviger is somewhat transitional between type I *b* and type I since the fifth segment is gradually expanded towards the distal end. On the whole, the specimen is more nearly related to *N. longicoxa* and *N. hamatum* than to *N. proceroides* and *N. tenuipes* (forms in which the auxiliary claws are absent). The chela is long and slender, and the sixth segment of the oviger is curved, as in the two first-named forms, but *Nymphon* sp.? may be easily distinguished from both by the palp which is very similar to that of *N. charcoti*; the second coxa and the tarsus are both relatively much longer than in that species (cf. also the ovigers, Figs. 10 *b* and 24 *e*). The tarsus is longer than in any other species in group I.

Nymphon, sp.? (Fig. 24 *a*, *c* and *d*).

St. 53. 12. v. 26. Port Stanley, East Falkland Island. Hulk of 'Great Britain': 1 ♀.

Description. *Trunk* rather compact; lateral processes separated by approximately their own diameter. Neck short; oviger base large, in contact with first lateral process. Ocular tubercle rather higher than wide; eyes conspicuous. Setae absent.

Proboscis short, stout, sub-cylindrical, rounded at apex; two-thirds of cephalic segment, and three-fourths of scape.

Abdomen reaching a short distance beyond fourth lateral process, elevated at an angle of 45°.

Chelophore. Scape four times as long as wide distally, bearing a few very fine setae. Chela subequal to scape; movable finger subequal to palm armed with eleven or twelve spinules; 15 spinules on immovable finger (Fig. 24 *d*).

Palp as represented in Fig. 24 *c*, two terminal segments together approximately four-fifths of second segment.

Oviger. Terminal claw rather more than half of tenth segment, armed with about seven spinules. Total number of denticulate spines 37 (11 + 10 + 7 + 9). Segments 4–6 short, in the proportions 1·5 : 2 : 1.

Third leg. Second coxa 1·4 times the sum of the first and third. Femur nine times as long as wide, subequal to first tibia. Second tibia the longest segment. Tarsus seven-tenths of propodus, ventral margin of the latter spinose (Fig. 24 *a*). Claw rather more than one-third of propodus, auxiliaries long, two-thirds of main claw. Setae few in number and very fine. There are long irregular patches of a light brownish or purplish colour on each of the three main segments.

Measurements (mm.)

Length of proboscis	0·6
Diameter of proboscis	0·33
Length of trunk	1·8
Length of cephalic segment	0·9
Width of anterior cephalic lobes	0·58
Width of neck	0·3
Width across second lateral processes	1·2
Length of abdomen	0·35

Third leg:

First coxa	0·35
Second coxa	1·1
Third coxa	0·42
Femur	3·0
First tibia	3·13
Second tibia	3·9
Tarsus	0·77
Propodus	1·05
Claw	0·4
Auxiliaries	0·37

Remarks. Although it is extremely small, this specimen is a mature female with developing ova in the femur of each leg. The male is unknown, so that the affinities of the species are uncertain, but it would appear to be allied to *N. subtile*, Loman. It differs from the latter, however, in several respects: (1) the body is more compactly built with a much shorter neck, (2) the legs are much longer relative to the size of the specimen, being 7·6 times as long as the trunk (as against 5·4 and 4·6 in the male and female respectively of *N. subtile*—see measurements), (3) the tarsus is longer relative to the propodus and the ventral margin of the latter is armed with five spines, (4) the two terminal palpal segments are shorter, and (5) the legs are characterized by the presence of long bands of a darkish colour.

This species shows affinities with some of the northern forms, e.g. *N. brevitarse*, Kröyer (Sars, 1891, pl. v, fig. 3).

B. GROUP II

Nymphon australe, Hodgson (Figs. 25 *d* and 26 *b*).

N. australe, Hodgson, 1902, p. 257, pl. xl.
Chaetonymphon altioculum, Möbius, 1902, p. 181, pl. xxvi, figs. 1–6.
Ch. australe, Hodgson, 1907, p. 32, pl. x, fig. 14.
Ch. australe var. *austrinorum*, Hodgson, 1907, p. 35, pl. iv, fig. 4; pl. x, fig. 15.
Ch. assimile, Hodgson, 1908, p. 175, pl. i, figs. 1, 1 *a*.
N. stylops, Bouvier, 1911, p. 1137; 1913, p. 73, text-figs. 25–31.
N. australe, Calman, 1915, p. 36.
Ch. australe var. *austrinorum*, Loman, 1923, p. 21.

St. WS 32. 21. xii. 26. Mouth of Drygalski Fjord, South Georgia, 91–225 m.; gy. M. Small beam trawl: many specimens, including ovigerous and larvigerous ♂♂.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 20 specimens, some brown, 1 with Polyzoa.

St. 45. 6. iv. 26. 2·7 miles S 85° E of Jason Light, South Georgia, 238–270 m.; gy. M. Large otter trawl: hundreds of specimens, many with encrusting Polyzoa.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, 230–250 m.; gy. M. Large otter trawl: 5 specimens, well chitinized, bearing Polyzoa; several smaller, very soft specimens.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, 122–136 m.; gn. M. St. Large otter trawl: 12 specimens, several soft.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, 155–178 m.; gn. M. S. Large otter trawl: many specimens, adult and immature.

St. 159. 21. i. 27. 53° 52′ 30″ S, 36° 08′ W, 160 m.; R. Large dredge: 4 specimens.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 342 m.; R. Large dredge: many specimens, all very setose, including ovigerous and larvigerous ♂♂.

St. 172. 26. ii. 27. Off Deception Island, South Shetlands, 525 m.; R. Large dredge: 2 specimens with *N. bouvieri*, n.sp.

St. 175. 2. iii. 27. Bransfield Strait, South Shetlands, 63° 17′ 20″ S, 59° 48′ 15″ W, 200 m.; M. St. G. Large dredge: 1 specimen.

St. 180. 2. iii. 27. 1·7 miles W of N point of Gand Island, Schollaert Channel, Palmer Archipelago, 160–330 m.; M. St. Large otter trawl: several specimens with *Colossendeis frigida*, *N. brevicaudatum* and *Pallenopsis pilosa*.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 160–335 m.; M. Large otter trawl: numerous specimens.

St. 182. 14. iii. 27. Schollaert Channel, Palmer Archipelago, 278–500 m.; M. Large otter trawl: several specimens; 1 ♂ with whole dorsal surface covered by an encrusting Polyzoon.

St. 186. 16. iii. 27. Fournier Bay, Anvers Island, Palmer Archipelago, 295 m.; M. Large dredge: 6 specimens.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 259 m.; M. Large dredge: numerous specimens, the majority with body and legs banded with dark brown.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Georgia, 391 m.; M. St. Large dredge: 2 specimens with *N. charcoti* and *N. biarticulatum*.

St. 366. 6. iii. 30. 4 cables S of Cook Island, South Sandwich Islands, 155–322 m. Large dredge: many specimens, including ♂♂ carrying eggs and advanced larvae.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 1 ♀, 1 immature specimen.

St. 456. 18. x. 30. 1 mile E of Bouvet Island, 40–45 m. Large dredge: 1 ♀.

St. 458. 19. x. 30. 7 miles S 50° W of Cape Circumcision, Bouvet Island, 357–377 m. Large dredge: many specimens including larvigerous ♂♂.

Description of male.[1] *Trunk*, as a rule, compact; lateral processes separated by a distance varying from one-fourth of, to equality with, their own diameter. Neck short, as a rule, but longer in some specimens than in others; cephalic segment nearly as wide anteriorly as long; base of oviger in contact with first lateral process. Ocular tubercle high (2·5–3 times as high as wide), eyes sub-terminal. A few setae on each lateral process and cephalic lobe.

Proboscis sub-cylindrical, approximately equal to cephalic segment and three-fourths of scape.

Abdomen reaching to distal articulation of first coxa, pyriform, bearing a few slender setae.

Chelophore. Scape 4·5 times as long as wide distally, setose (Bouvier, 1913, p. 76, fig. 27). Fingers longer than palm, each armed with 38–46 crowded spinules; setose pad small, on proximal third of immovable finger.

Palp. For proportions of segments 2–5 see Table VI and Fig. 25 *d*.

Oviger as represented in Fig. 26 *b*; terminal claw three-fourths of tenth segment, armed with 7–9 spinules. Total number of denticulate spines 23–37. Segments 4–6 in the proportions 1·36 : 2 : 1; segment 5 much inflated in distal half and the thin walled portion (*x*) is often collapsed in fixed material; segment 6 also swollen and thin walled, often caved in at *x*.

Third leg rather short and setose. Second coxa slightly longer than the sum of the first and third. Femur shorter than either tibia; numerous (16–18) small, obscure gland

[1] This species has been described at considerable length by various authors (see synonymy), but a very brief description of the male is given here for the sake of uniformity.

openings on proximal two-thirds of mid-ventral surface. First tibia the longest segment. Tarsus and propodus both elongated, the former considerably longer than the latter. Claw approximately half as long as propodus, auxiliaries vestigial.

The *female* has the oviger of the normal female type; the femur is rather swollen ventrally except in the distal third, the length being 3·5–4·5 times the maximum width.

Remarks. A re-examination of Hodgson's type specimens of *N. assimile* left no doubt as to their identity with *N. australe*.

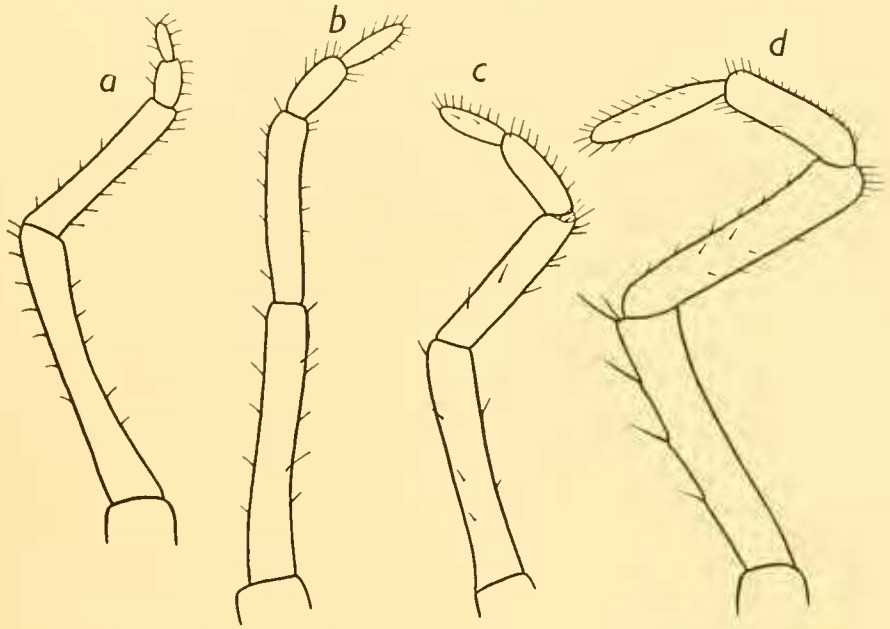

Fig. 25. Palp of: *a. Nymphon bouvieri*, n.sp. *b. N. brevicaudatum*, Miers. *c. N. neumayri*, n.sp. *d. N. australe*, Hodgson. (All × 27.)

The Discovery specimens from St. 170 agree with the co-types of *N. australe*; the lateral processes are but little separated, the legs are relatively stout and bear numerous long setae. The majority of the specimens, however, have the legs more slender and less setose, the body less compact, and thus agree more closely with *N. australe* var. *austrinorum*, Hodgson. Many of the specimens, especially those from St. WS 32 to St. 144 (in the list of stations) are even less setose than the *austrinorum* forms.

Loman (1923, p. 13) has emphasized the importance of the number of denticulate spines on the four terminal segments of the oviger in the genus *Nymphon*. In nine co-types of *N. australe* examined the total number of denticulate spines varied from twenty-three to thirty, and in six co-types of *N. australe* var. *austrinorum*[1] from thirty to thirty-seven. The greater number in the variety is probably due to the fact that the specimens are of considerably larger size than the typical forms. At any rate, the number varied from twenty-eight to thirty-four in all samples of the Discovery material

[1] Hodgson (1907, p. 35) states that in *N. australe* var. *austrinorum* the "tarsus and propodus together are distinctly shorter than the femur" and equal to it in typical specimens; but in the co-types measured, tarsus and propodus together are nearly equal to the femur in *N. australe* as well as in the variety *austrinorum*.

where the *australorum* forms are smaller, and the typical specimens (St. 170) somewhat larger, than Hodgson's co-types.

Table VI

Name of species in group II	Relative proportions* of palpal segments 2–5				Total length of segments
	2	3	4	5	4 + 5
N. capense	10 :	9·00 :	6·00 :	5·00	11·00
N. compactum	10	9·70	6·08	5·80	11·88
N. compactum	10	9·10	5·46	5·46	10·92
N. australe, co-type	10	9·20	5·60	4·80	10·40
N. australe, co-type	10	9·30	5·56	4·44	10·00
N. australe, St. 172	10	7·00	5·00	4·50	9·50
N. australe var. *australorum* co-types	10	8·60	6·00	5·70	11·70
	10	8·20	5·30	4·70	10·00
N. orcadense, co-type	10	8·00	4·80	4·80	9·60
N. orcadense, co-type	10	7·90	5·40	5·20	10·60
N. articulare	10	6·25	3·75	4·05	7·80
N. neumayri, holotype	10	7·80	4·80	3·00	7·80
N. neumayri, paratype	10	6·66	4·10	3·33	7·43
N. villosum, holotype	10	7·30	3·00	3·70	6·70
N. brevicaudatum, paratype	10	6·10	2·12	2·27	4·39
N. brevicaudatum, St. WS 42	10	6·66	2·00	2·00	4·00
N. brevicaudatum, St. 159	10	6·10	2·61	2·82	5·43
N. biarticulatum, holotype	10	7·25	2·00	2·25	4·25
N. biarticulatum, St. 182	10	7·40	2·22	2·22	4·44
N. biarticulatum, St. 190	10	6·66	2·00	2·20	4·20
N. proximum, holotype	10	6·66	2·11	2·11	4·22
N. mendosum, holotype	10	6·10	2·17	1·74	3·91
N. mendosum, co-type	10	5·60	2·00	1·50	3·50
N. mendosum, T.N. 340†	10	6·00	2·22	2·20	4·20
N. ? *biarticulatum*, St. 167	10	6·86	1·86	1·71	3·57
N. ? *biarticulatum*	10	8·86	1·77	1·77	3·54
N. ? *biarticulatum*	10	6·66	1·83	1·50	3·33
N. bouvieri, paratype	10	5·5	1·82	0·91	2·73
N. bouvieri	10	6·40	1·82	1·00	2·82
N. bouvieri	10	6·00	1·60	1·00	2·60

* In order the more readily to compare these proportions, the length of the second segment is regarded as = 10.

† T.N. = Terra Nova collection.

N. australe differs from the majority of the species in group II in two respects: (1) the auxiliary claws are vestigial, and (2) the oviger in the male shows a considerable departure from the norm, certain portions being much inflated and thin walled (cf. Fig. 26 *b* with Figs. 26 *a* and *c*, and 27). Two other Antarctic species, not represented in the Discovery collection, were also found to have certain segments inflated—viz. *N. capense*, Hodgson, and *N. compactum*, Hoek (see Gordon, 1932, pp. 115–120). In both these species the auxiliaries are absent. The inflated condition is least developed in *N. compactum* and most pronounced in *N. australe*. In all three species segment 5 is relatively short and stout so that they may be regarded as aberrant members of group II. *N. australe* shows affinities with *N. orcadense* (see Table III), for the palp

and chela are very similar in both and there is approximately the same number of denticulate spines on the oviger.

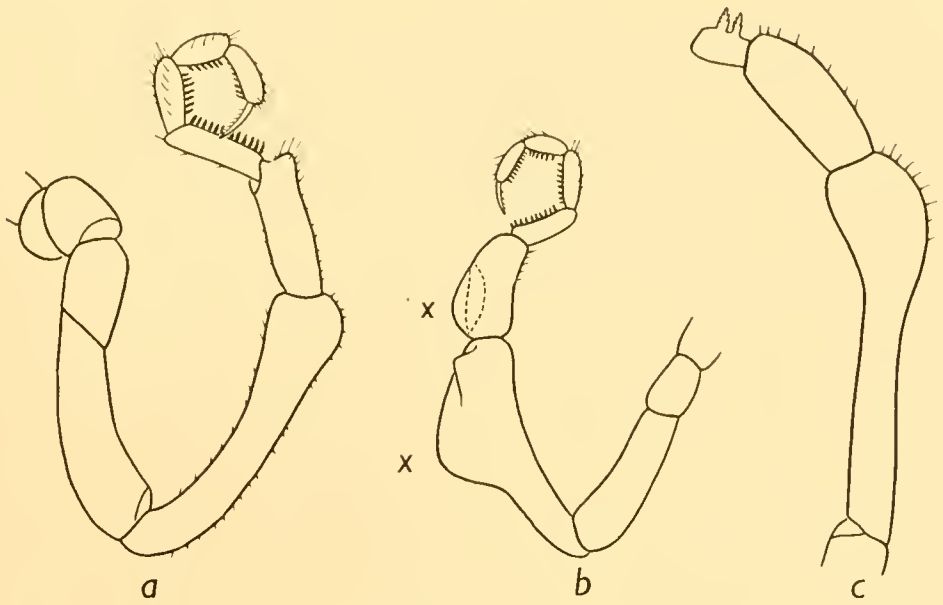

Fig. 26. Male oviger of: *a*. *Nymphon orcadense*, Hodgson: ×17. *b*. *N. australe*, Hodgson: ×17. Type II *a*; segments 5 and 6 thin-walled and inflated at *x*. *c*. Segments 5–7 of male oviger of *N. brevicaudatum*, Miers: × 27.

Distribution. Circumpolar; this is the first record of the typical *australe* form from the western side of the Antarctic (cf. Loman, 1923, p. 21).

Nymphon orcadense, Hodgson (Fig. 26 *a*).

Chaetonymphon orcadense, Hodgson, 1908, p. 173, pl. ii, figs. 2, 2 *a*.
Chaetonymphon orcadense, Loman, 1923, p. 22.
Nymphon orcadense, Calman, 1920, p. 246.

St. 163. 17. ii. 27. Paul Harbour, Signy Island, South Orkneys, 18–27 m. Small beam trawl: 18 specimens, including ovigerous ♂♂, several with encrusting Polyzoa.

St. 164. 18. ii. 27. E end of Normanna Strait, South Orkneys, near Cape Hansen, Coronation Island, 24–36 m. Small beam trawl: many specimens both adult and immature; several with encrusting Polyzoa.

Description of male. *Trunk* compact, lateral processes in contact proximally or separated by very narrow intervals. Neck short; oviger base, as usual in the short-necked forms, occupying the gap between anterior cephalic lobe and first lateral process. Anterior width of cephalon seven-eighths of length. Height of ocular tubercle nearly twice the width, which increases somewhat towards the apex where the eyes are situated. A few setae near the distal articulation of each lateral process and on each anterior cephalic lobe.

Proboscis equal to cephalic segment and a little shorter than scape, greatly expanded in the middle.

Abdomen rather short, reaching to middle of first coxa; bifid; not elevated.

Chelophore. Scape, which bears several long and numerous short, fine setae, nearly four times as long as wide distally. Fingers of chela slightly longer than palm, each armed with 35–45 spinules according to the size of the specimen; setose pad extending half-way along immovable finger.

Palp. Two terminal segments together approximately equal to, and third four-fifths of, second segment (Table VI).

Oviger. Terminal claw half as long as tenth segment, armed with 10–13 spinules; total number of denticulate spines 30–36. Segments 4–6 in the proportions 1·68 : 2·22 : 1, segment 5 short, rather curved and distinctly clubbed distally. The termino-lateral

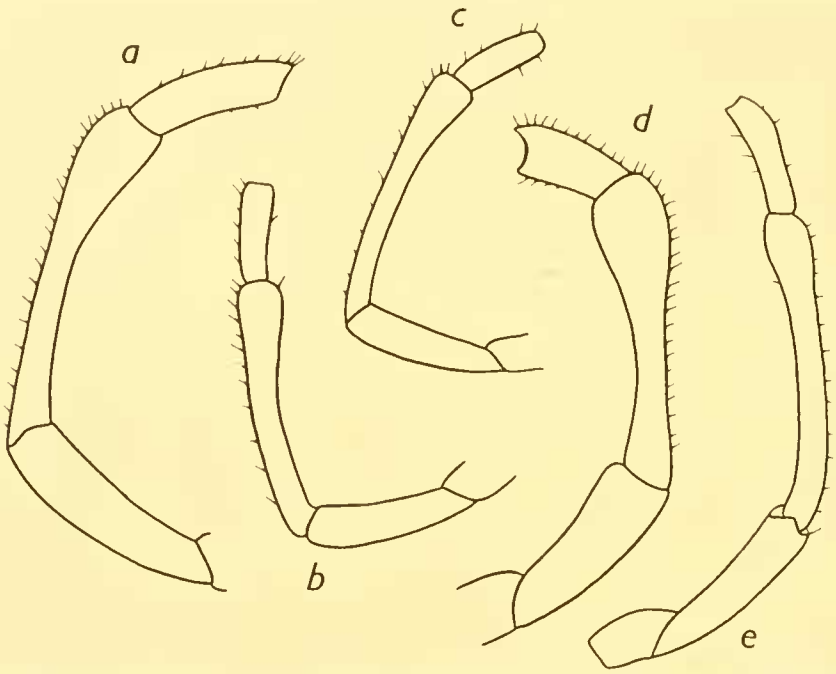

Fig. 27. Segments 4–6 of male oviger of: *a*. *Nymphon proximum*, Calman. *b*. *N. bouvieri*, n.sp. *c*. *N. mendosum*, Hodgson. *d*. *N. biarticulatum*, Hodgson. *e*. *N. neumayri*, n.sp. (Type II—all × 20.)

articulation of the seventh on the sixth segment is characteristic of this species (Fig. 26 *a*).

Third leg. Second coxa a little longer, dorsally, than the sum of the other two. Femur shorter than either tibia, at least thirty crowded, small gland openings along mid-ventral surface; second tibia slightly longer than first. Tarsus and propodus both elongated and armed ventrally with numerous fine setae; the former always slightly longer than the latter (1·05–1·31 : 1). Claw nearly half as long as propodus as a rule; auxiliaries from one-fourth to one-third of main claw.

The legs are robust and setose; in addition to the fine, short setae, there are long setae at the distal articulation of (1) the third coxa—ventrally; (2) the femur—dorsally; (3) each tibia—ventrally; and a number of strong setae along the lateral margins of the latter.

The female does not differ markedly from the male. The legs, especially as regards the femur, are more robust and less setose. The oviger is of the usual type with the seventh normally articulated to the sixth segment.

Remarks. The specimens in the Discovery collection agree well with the co-types from Scotia Bay.

This species undoubtedly belongs to group II and yet it has (1) a rather shorter abdomen, (2) a longer second tibia, (3) more numerous spinules[1] on the fingers of the chela, and (4) a higher number of denticulate spines on the oviger than any of the other typical species (see Table III). In all these respects it approaches *N. clarenci*, n.sp., and *N. brachyrhynchum*, Hoek, especially the former in which the palp is of the same type. Also the atypical[2] species in group II are more closely allied to *N. orcadense* than to any of the other typical species.

Distribution. Previously recorded from Scotia Bay; Burdwood Bank, south of Falkland Islands and South Georgia.

Nymphon articulare, Hodgson (Figs. 23 *a*, 28 and 29 *a*, *b*).

Hodgson, 1908, pp. 170–172, pl. i, figs. 4, 4 *a*.
Bouvier, 1913, p. 72 (in key).
Loman, 1923, p. 13 (in table).

St. 164. 18. ii. 27. E end of Normanna Strait, South Orkneys, near Cape Hansen, Coronation Island, 24–36 m. Small beam trawl: 1 ♀, 1 ♂ and several immature specimens.

Description of male topotype.[3] *Trunk* non-setose, rather compact; lateral processes separated by half of their own diameter or rather more. Neck very short, the posterior two-thirds on either side occupied by the base of the oviger; cephalic segment almost as wide anteriorly as long. Ocular tubercle high and rather wide; eyes small and set near to the bifid apex.

Proboscis a little shorter than scape and equal to cephalic segment; stout, subcylindrical, contracted somewhat at base.

Abdomen pyriform, reaching to distal end of first coxa; elevated at an angle of about 10°.

Chelophore. Scape rather longer than chela, with a few long, fine setae along the dorsal surface; length 4·5 times the greatest width. Chela as represented in Fig. 28, fingers rather longer than palm and each armed with short, irregular, often recurved, spinules. The number of spinules varies from eighteen to twenty-five in the five co-types, and there are 2–6 more on the movable than on the immovable finger. Setose pad extending half-way along the latter.

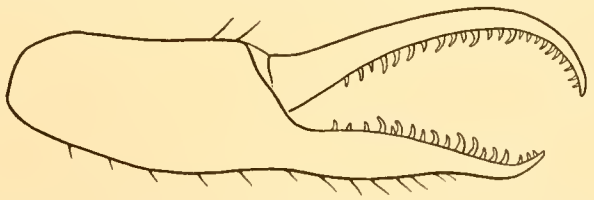

Fig. 28. *Nymphon articulare*, Hodgson. Chela of co-type: × 47. The palm may not be quite accurate as proximal part was damaged on slide.

[1] *N. brevicaudatum* and *N. biarticulatum* have approximately the same number as *N. orcadense*.
[2] Especially *N. australe*, see p. 62; and also Table VI.
[3] Hodgson apparently did not examine this specimen, see p. 66.

Palpal segments 2–5 in the proportions 4 : 2·5 : 1·5 : 1·62.

Oviger. Terminal claw half as long as tenth segment, armed with 7–10 small spinules. Total number of denticulate spines 25 (7 + 6 + 5 + 7). Segments 4–6 in the proportions 1·85 : 2·54 : 1; segment 5 short and clubbed distally (Fig. 24 *a*).

Third leg rather slender and setose; a number of long, fine setae on the coxae and at the distal end of the femur (maximum length equal to the diameter of the segment); those on the distal segments sparse and very short. Coxae short and stout, dorsal length of second equal to the sum of the first and third. Femur subequal to second, first tibia the longest segment. Tarsus and propodus both elongated, the former nine-tenths of the latter. Claw not quite half as long as propodus; auxiliaries well developed, one-third of main claw.

Measurements (*mm.*)

	♂	♀
Length of proboscis	1·08	1·12
Diameter of proboscis	0·56	0·6
Length of trunk	2·4	2·6
Length of cephalic segment	1·06	1·12
Width of cephalon	0·96	1·0
Width of neck	0·56	0·48
Width across second lateral processes	2·0	2·0
Length of abdomen	0·88	0·84
Length of scape	1·32	1·48
Third leg:		
First coxa	0·6	0·6
Second coxa	0·9	0·8
Third coxa	0·3	0·25
Femur	1·8	1·8
First tibia	2·1	2·08
Second tibia	1·9	1·75
Tarsus	0·9	0·9
Propodus	1·05	1·0
Claw	0·44	0·48
Auxiliaries	0·16	0·16

The *female* is characterized by having the femur much enlarged in the proximal two-thirds. The length is only 2·5 times the maximum width as against 4·5 times in the male (Fig. 29 *a* and *b*).

Remarks. Hodgson (1908, p. 172) mentions only three adult females in his description, but five specimens, including one male and all undoubtedly belonging to this species, were obtained on loan from the Royal Scottish Museum, Edinburgh. Hodgson apparently did not have two of these specimens and referred the species to the genus "*Nymphon*", while in reality it belongs to the "*Chaetonymphon*" group as is shown by the form of the male oviger (Fig. 23 *a*). *N. neumayri*, n.sp., is closely related to *N. articulare*; the most outstanding differences between the two are listed on p. 69.

Distribution. South Orkneys.

Nymphon neumayri, n.sp. (Figs. 27 *e*, 29 *c–e* and 30).

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259 m.; M. Large dredge: 3 ♂♂, 3 ♀♀ and 3 immature specimens, with *N. australe*.

DESCRIPTION OF HOLOTYPE (♂). *Trunk* compact, last two pairs of lateral processes in contact proximally, the others separated by very short intervals. Cephalic segment as wide anteriorly as long; neck very short, base of oviger occupying most of the space between anterior cephalic lobe and first lateral process. Ocular tubercle high (0·8 mm.), very wide at base (0·6 mm.), tapering to about half that width at the apex on which the four eyes are set. Setae almost entirely absent (Fig. 30).

Proboscis stout, sub-cylindrical, rounded at apex, somewhat contracted at base; slightly shorter than either scape or cephalic segment.

Abdomen horizontal, fusiform, reaching to middle of second coxa.

Scape of *chelophore* nearly four times as long as wide, with a few very minute setae at the distal end. Chela shorter than scape (see measurements), palm short, ovoid, fingers half as long again as palm, much curved, each armed with seven or eight long spinules; a few fine setae on proximal half of immovable finger (Fig. 29 *d*).

Palp with two terminal segments together approximately equal to third, and three-fourths of second segment (segments 2–5 in the proportions 10 : 7·7 : 4·4 : 3·2 and in female as 10 : 7·8 : 4·8 : 3).

Oviger. Terminal claw subequal to tenth segment and armed with 4–5 spinules. Total number of denticulate spines, 26.[1] Segments 4–6 as represented in Fig. 27 *e*, and in the proportions 1·82 : 2·55 : 1.

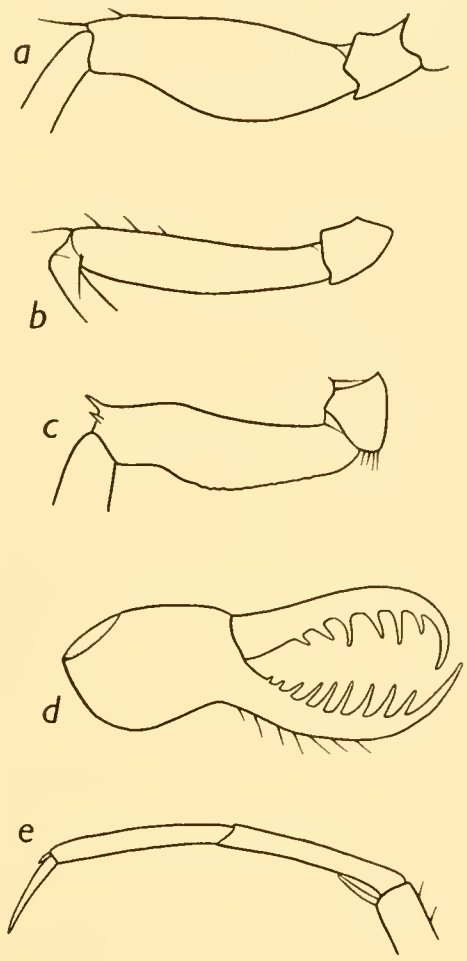

Fig. 29. *Nymphon articulare*, Hodgson: *a*. Femur of third leg of female. *b*. Same of male. *Nymphon neumayri*, n.sp.: *c*. Femur of male. *d*. Chela. *e*. Terminal segments of third leg. (*a–c*: × 20; *d* and *e*: × 27.)

Third leg rather stout proximally, and tapering gradually from the distal articulation of the first tibia where the width is suddenly reduced to almost one-half (i.e. proximal width of second is less than two-thirds distal width of first tibia, see Fig. 30 *c*, ♀). Second coxa equal to the sum of the other two (dorsal measurements). Femur shorter than either tibia, three times as long as wide and slightly inflated ventrally (Fig. 29 *c*); no raised femoral gland tubercles are present and, indeed, no trace of gland openings has been observed. First tibia the longest segment. Tarsus subequal to propodus; claw approximately half the length of the latter; auxiliary claws very short, about one-fifth of claw.

[1] The number varies from 22–27 in adults and the following are typical formulae 6 + 6 + 4 + 6; 7 + 7 + 5 + 7; 8 + 6 + 5 + 7; 8 + 7 + 5 + 7; in an immature specimen 3 + 4 + 2 + 5.

Setae are small and few in number; there are 4–6 spinose setae near the distal articulation of the femur (Fig. 29 *c*) and a large spine, on the mid-ventral line, at the distal end of the second tibia (Fig. 29 *e*).

The *female* shows the usual sexual differences of oviger and legs; the femur (Fig. 30 *c*) is much enlarged throughout three-fourths of its length; the genital pores are very conspicuous.

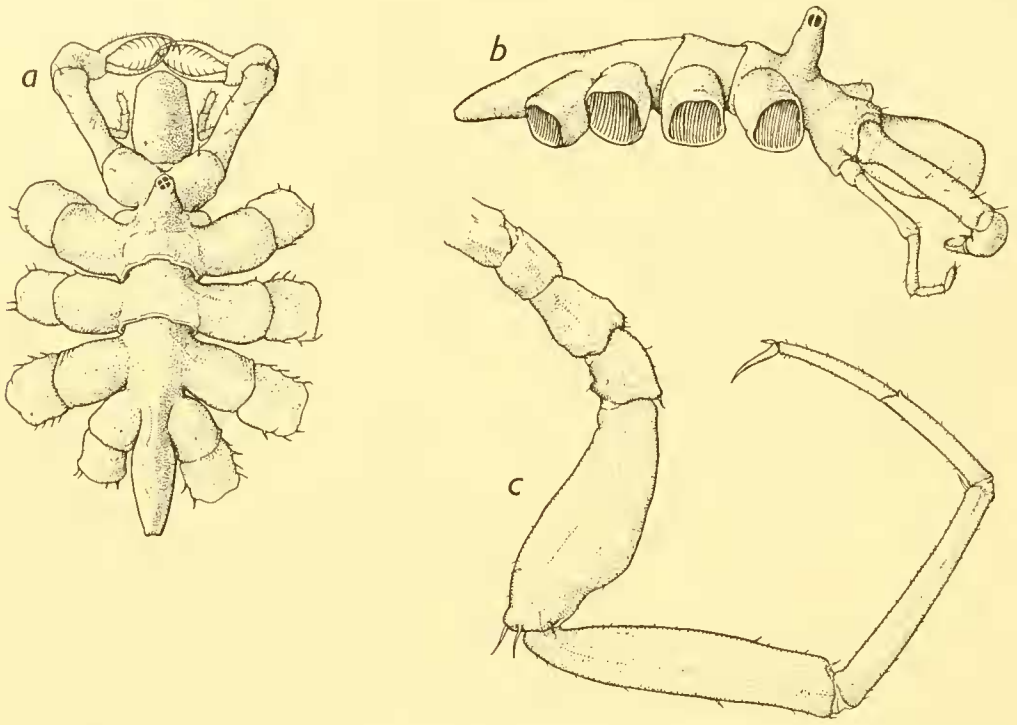

Fig. 30. *Nymphon neumayri*, n.sp.: *a*. Holotype. Dorsal view of body with chelophores and palps. *b*. Holotype. Lateral view of body, with chelophore and palp. *c*. Third leg of female.

Measurements (*mm.*)

	Holotype	♀
Length of proboscis	1·4	1·8
Diameter of proboscis	1·0	0·9
Length of trunk	4·0	4·4
Length of cephalic segment	1·8	2·0
Width of cephalic lobes	1·8	2·3
Width across second lateral processes	3·3	3·4
Length of abdomen	2·1	2·0
Length of scape	2·2	2·2
Length of chela	1·6	1·6
Third right leg:		
First coxa	0·8	0·8
Second coxa	1·2	1·2
Third coxa	0·4	0·4
Femur	3·01	3·2
First tibia	4·2	4·4
Second tibia	3·6	3·8
Tarsus	1·8	1·9
Propodus	1·75	1·8
Claw	0·8	0·9

Remarks. This species is much less setose than is typical of the short-necked, compactly built forms, there being no long setae on the body and very few on the legs. The chela differs from that of all the allied forms; it recalls that of *N. proceroides*, Bouvier (cf. Figs. 29 *d* and 9), but the fingers are much curved and the spinules are longer and fewer in number.

N. neumayri is most closely allied to *N. articulare*, Hodgson, which also has the femur in the female much enlarged throughout part of its length (Fig. 29 *a*). But it may be readily distinguished from the latter by (1) its larger size and more compact build, (2) the widely gaping fingers of the chela each armed with 6–9 instead of 18–25 spinules, and (3) the marked difference in the outline of the femur in the male (cf. Fig. 29 *b* and *c*).

Nymphon brevicaudatum, Miers (Figs. 25 *b*, 26 *c* and 31 *b*, *d*).

N. brevicaudatum, Miers, 1875, p. 117.
N. brevicaudatum, Miers, 1879, p. 212, pl. xi, fig. 8.
Chaetonymphon brevicaudatum, Möbius, 1902, p. 181, pl. xxv, fig. 9.
Ch. brevicaudatum, Loman, 1923, p. 21.

St. 27. 15. iii. 26. West Cumberland Bay, South Georgia, 110 m.; M. R. Large dredge: 3 adult and 4 immature specimens.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, 179–235 m.; gy. M. Large otter trawl: 12 specimens.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, 120–204 m.; M. Large otter trawl: many specimens, one carrying a Brachiopod.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, 230–250 m.; gy. M. Large otter trawl: 12 specimens, 1 carrying a sponge.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, 122–136 m.; gn. M. St. Large otter trawl: many specimens.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia, 200 yards from shore, under Mount Duse, 17–27 m.; M. Small beam trawl: many specimens, several of the ♂♂ carrying eggs or larvae, two stages on one specimen.

St. 143. 30. xii. 26. Off mouth of East Cumberland Bay, South Georgia, 273 m.; M. Large otter trawl: 1 larvigerous ♂.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, 155–178 m.; gn. M. S. Large otter trawl: several specimens.

St. 145. 7. i. 27. Stromness Harbour, South Georgia, between Grass Island and Tonsberg Point, 26–35 m. Small beam trawl: several specimens.

St. 148. 9. i. 27. Off Cape Saunders, South Georgia, 132–148 m.; gy. M. St. Large otter trawl: a dozen specimens, several ovigerous ♂♂.

St. 149. 10. i. 27. Mouth of East Cumberland Bay, South Georgia, 200–234 m.; M. Large otter trawl: 2 specimens.

St. 156. 20. i. 27. 53° 51′ S, 36° 21′ 30″ W, 200–236 m.; R. Large dredge: 5 specimens.

St. 159. 21. i. 27. 53° 52′ 30″ S, 36° 08′ W, 160 m.; R. Large dredge: many specimens.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 342 m.; R. Large dredge: 3 specimens.

St. 175. 2. iii. 27. Bransfield Strait, South Shetlands, 63° 17′ 20″ S, 59° 48′ 15″ W, 200 m.; M. St. G. Large dredge: 2 specimens with *N. australe*.

St. 177. 5. iii. 27. 27 miles SW of Deception Island, South Shetlands, 1080 m.; M. cS. St. Large dredge: 2 specimens.

South Georgia:

St. WS 33. 21. xii. 26. 54° 59′ S, 35° 24′ W, 130 m.; gy. M. St. 1 m. horizontal tow-net: 1 specimen.

St. WS 42. 7. i. 27. 54° 41′ 45″ S, 36° 47′ W, 198 m.; bottom. 1 m. horizontal tow-net: 1 specimen.

St. MS 10. 14. ii. 25. East Cumberland Bay. $\frac{1}{4}$ mile SE of Hope Point to $\frac{1}{4}$ mile S of Government Flagstaff, 18–26 m. Small beam trawl: 6 specimens.

St. MS 12. 17. ii. 25. East Cumberland Bay. 1 cable E to 1 mile S × E $\frac{1}{2}$ E of Hobart Rock, 25–60 m. Small beam trawl: 1 specimen.

St. MS 25. 13. iv. 25. East Cumberland Bay. $4\frac{1}{2}$ cables NE to $1\frac{1}{4}$ cables N × W of Hobart Rock, 36 m. Small beam trawl: 2 specimens.

St. MS 33. 1. v. 25. 1 cable E of Hobart Rock, East Cumberland Bay, 40 m. Small beam trawl: 1 specimen.

St. MS 63. 24. ii. 26. East Cumberland Bay. 1·3 miles S × E to 1·6 miles SE × S of Hope Point, 23 m. Small beam trawl: 3 specimens.

Redescription of holotype (ovigerous ♂).[1] *Trunk* compact; lateral processes separated by less than half their own diameter, last two pairs in contact proximally. Neck short but distinct; space between anterior cephalic lobes and first lateral process entirely occupied by the oviger base; anterior width of cephalon five-sixths of the length. Ocular tubercle of medium height, cylindrical and rather stout; eyes sub-terminal.

There are 4–6 long, and a few shorter, setae on the mid-dorsal surface of segments 1, 2 and 3 respectively, and two long setae on each cephalic lobe.[2] The lateral processes each bear a number of setae of which 2–4 near the distal articulation are longest.

Proboscis short, stout, sub-cylindrical, rounded at apex; subequal to cephalic segment and considerably shorter than scape.

Abdomen horizontal, reaching a short distance beyond first coxa; sub-cylindrical, tapering distally; three setae, of which the median is longest, at base and a few tiny setae on the distal half.

Chelophore rather similar to that of *N. biarticulatum*, Miers. Scape setose;[3] length nearly four times the distal width. Fingers equal to palm, each armed with twenty-nine and thirty-five crowded spinules of unequal lengths.

Palp rather slender; proportions of segments 2–5 as represented in Fig. 26 *b* (see also Table V).

Oviger. Terminal claw subequal to tenth segment, armed with five spinules. Total number of denticulate spines eleven (see Table III). Segments 4–6 in the proportions 1·35 : 2·3 : 1; segment 5 clubbed distally (Fig. 27 *c*).

[1] The most complete of the type specimens has been selected as holotype; B.M. collection.

[2] Three or four in all the paratypes.

[3] 3–4 long setae longitudinally on the mid-dorsal surface; a few finer, shorter setae on proximal half of outer margin; a semicircle of setae, increasing gradually in length towards the inner edge, near the distal articulation.

Third leg relatively short and setose; the length of the setae on each tibia and at the distal end of femur is equal to the diameter of the segment. Second coxa as long as the sum of the first and third (dorsal measurements). Three or four high wide gland tubercles on mid-ventral surface of femur, which is equal to second tibia; first tibia the longest segment (see Table III). Tarsus shorter than propodus; claw less than half as long as the latter; auxiliaries well developed, one-third of main claw.

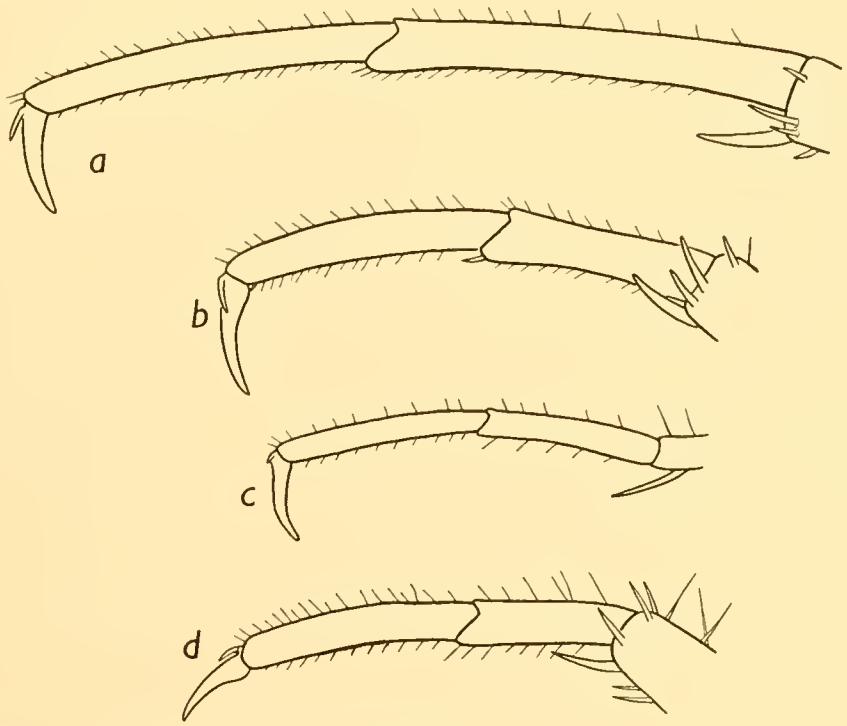

Fig. 31. Terminal segments of third leg of:
Nymphon biarticulatum, Hodgson: *a*, adult; *c*, young from St. 181 (length = 4 mm.).
N. brevicaudatum, Miers: *b*, adult co-type; *d*, young from St. 42 (length = 4 mm.).

Remarks. The majority of the specimens in the Discovery collection come from the neighbourhood of South Georgia. A few specimens were collected off Clarence Island and the South Shetlands, but none from Palmer Archipelago, where the bulk of the specimens referred to *N. biarticulatum*, Hodgson, occurred. *N. brevicaudatum* and *N. biarticulatum* are very closely allied and the latter may prove to be a more southern variety of the former (see p. 72).

Distribution. Kerguelen, South Georgia and South Shetlands.

Nymphon biarticulatum, Hodgson (Figs. 27 *d*, 31 *a*, *c* and 32 *a*).

Chaetonymphon biarticulatum, Hodgson, 1907, p. 28, pl. iv, fig. 2; pl. x, fig. 12.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys, 244–344 m.; gn. M. Large otter trawl: 6 specimens.

St. 180. 11. iii. 27. 1·7 miles W of N point of Gand Island, Schollaert Channel, Palmer Archipelago, 160 m.; M. St. Large dredge: 3 ♂ specimens.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 160–335 m.; M. Large otter trawl: 20 specimens.

St. 182. 14. iii. 27. Schollaert Channel, Palmer Archipelago, 278–500 m.; M. Large otter trawl: several specimens.

St. 190. 24. iii. 27. Bismarck Strait, Palmer Archipelago, 315 m.; M. R. Large dredge: 4 specimens (1 immature).

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 391 m.; M. St. 2 adult and 2 immature specimens with *Nymphon charcoti* and *N. australe*.

Redescription of holotype (♀). *Trunk* compact; lateral processes separated by approximately half their own diameter, last two pairs almost in contact proximally. Neck short; base of oviger occupies the entire space between first lateral process and anterior cephalic lobe. Ocular tubercle three times as high as wide; eyes small, situated near the apex. There is a pair of long setae[1] on the mid-dorsal surface of segments 1–3 and on each cephalic lobe.

Proboscis slightly longer than cephalic segment, a little shorter than scape; stout and sub-cylindrical.

Abdomen reaching to middle of second coxa; wide in middle and tapering abruptly towards the apex; setae very minute. Not elevated.

Chelophore. Scape setose, length 4·5 times the distal width. Palm long and narrow, equal to movable finger which is armed with 40–42 spinules; immovable finger with 30–33 spinules and a setose pad on the proximal half (Fig. 32 *a*).

Palp very similar to that of *N. brevicaudatum*, Miers (for proportions of segments 2–5 see Table V).

Oviger. Terminal claw slightly longer than tenth segment, armed with eight long spinules. Total number of denticulate spines 18 (6 + 5 + 3 + 4). Segments 4–6 rather long, in the proportions 1·43 : 1·71 : 1 (Fig. 27 *d*).

Third leg. Second coxa equal to the sum of the other two (dorsal measurements). Femur robust, 3·5 times as long as wide; first tibia the longest segment (Table III). As in *N. brevicaudatum* there are long setae on the legs, especially on the three principal segments.

Tarsus and propodus slender, elongated, the former exceeding the latter in length (Fig. 31 *a*). Claw approximately one-third of propodus, auxiliaries well developed.

Remarks. The holotype, which is now rather damaged and broken, is very closely allied to *N. brevicaudatum*, Miers, but the tarsus is longer, not shorter, than the propodus (cf. Fig. 31 *a* and *b*). A number of specimens in the Discovery collection have been referred to *N. biarticulatum*, Hodgson, because the tarsus is consistently longer relative to the propodus than in *N. brevicaudatum*. In adults the tarsus is equal to or longer than, and in immature specimens is only a very little shorter than, the propodus (cf. Fig. 31 *a*, *c* and *b*, *d*). The movable finger of the chela is rather longer than the palm.

This species is very closely related to, and may prove to be only a more southern

[1] There are also a number of long setae on each lateral process, but they have been rubbed off.

form of, *N. brevicaudatum*. In addition to the longer tarsus already mentioned, the ocular tubercle is higher, the abdomen is more narrowed posteriorly and the fingers of the chela are rather longer than in *N. brevicaudatum*.

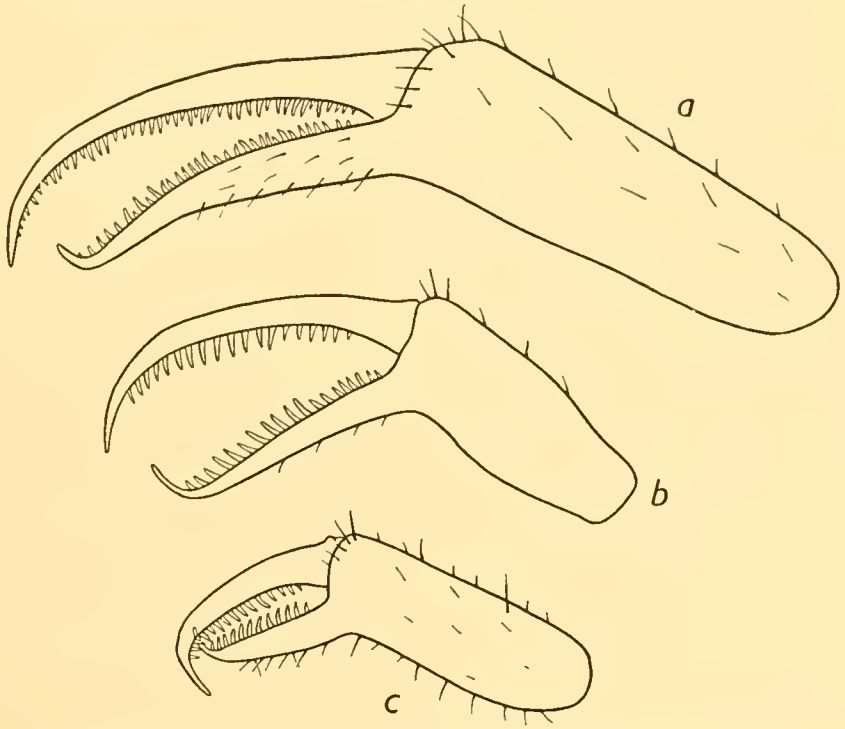

Fig. 32. Chela of: *a. Nymphon biarticulatum*, Hodgson, holotype. *b. N. mendosum*, Hodgson. *c. N. bouvieri*, n.sp. (All × 27.)

The specimens from St. 167 have been provisionally referred to this species. The tarsus is nearly as long as the propodus—i.e. longer than is typical for *N. brevicaudatum* —but the two terminal segments of the palp are consistently shorter than in either species (see Table V).

Distribution. The holotype was collected in the Ross Sea area; with the exception of the specimens from Sts. 167 and 195 this form was collected beyond the southern range for *N. brevicaudatum*.

Nymphon bouvieri, n.sp. (Figs. 25 *a*, 27 *b*, 32 *c* and 33).

St. 172. 26. ii. 27. Off Deception Island, South Shetlands, 525 m.; R. Large dredge: 4 specimens 2 ♂♂ (length of holotype 5·3 mm.) and 2 ♀♀.

Description of holotype (♂). *Trunk* compact (Fig. 32 *a*); lateral processes in contact proximally, each with a few long setae; 2–3 long setae on mid-dorsal surface near the posterior articulation of each segment. Neck very short; cephalic segment almost as wide anteriorly as long. Ocular tubercle high and slender (4–6 times as high as wide); eyes small and sub-terminal.

Proboscis short, two-thirds of cephalic segment and of scape; slightly expanded in middle, rounded at apex.

Abdomen pyriform, reaching to middle of second coxa; not elevated.

Chelophore. Scape equal to cephalic segment, setose (Fig. 33 *a*). Fingers of chela shorter than palm, abruptly bent distally, armed with twelve and fifteen spinules respectively (Fig. 32 *c*).

Palp as represented in Fig. 25 *a*; two terminal segments very short, together less than one-third of second (this is true of all four specimens, see Table V).

Oviger. Terminal claw rather shorter than tenth segment, armed with five spinules.

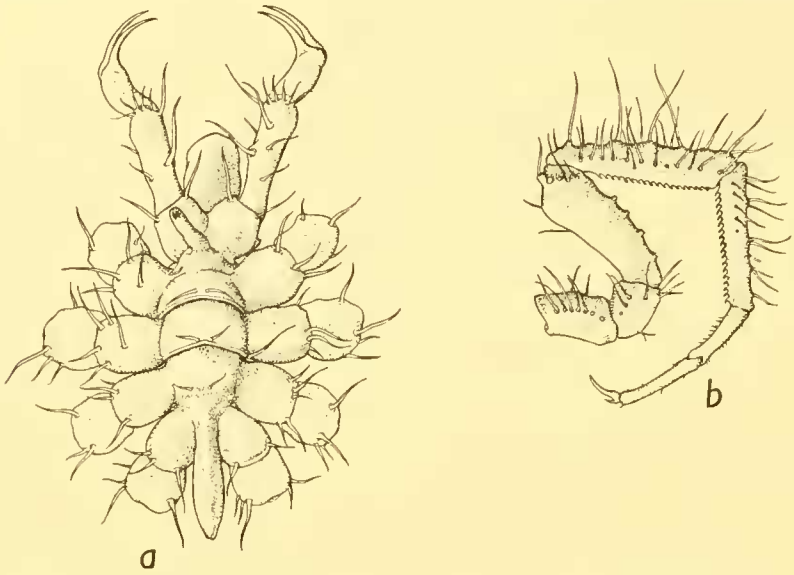

Fig. 33. *Nymphon bouvieri*, n.sp. Holotype: *a*. Dorsal view of body with chelophores: × 12—proboscis foreshortened. *b*. Third leg.

Total number of denticulate spines 15–18. Segments 4–6 in the proportions 1·7 : 2·5 : 1 (Fig. 27 *b*).

Third leg short and setose (Fig. 33 *b*); setae, as a rule, longer than the diameter of the segment to which they are attached. Second coxa equal to the sum of the other two. Femur subequal to second tibia, with 3–4 high wide gland tubercles on mid-ventral surface. First tibia the longest segment (see measurements). Tarsus approximately two-thirds of propodus; claw nearly half as long as the latter; auxiliaries well developed one-fourth of claw.

Measurements (*mm.*)

Length of proboscis	1·4
Diameter of proboscis	1·0
Length of trunk	3·6
Width across second lateral processes	3·3
Length of cephalic segment	2·0
Width of cephalic lobes	1·8
Length of abdomen	2·0
Length of scape	2·0

Third leg:	
First coxa	0·8
Second coxa	1·2
Third coxa	0·4
Femur	2·2
First tibia	3·25
Second tibia	2·4
Tarsus	1·0
Propodus	1·5
Claw	0·53
Auxiliaries	0·13

The *female* shows the usual sexual differences; the femur is more robust, the length being just over twice the maximum width.

Remarks. Although it bears a strong superficial resemblance to *N. brevicaudatum*, Miers, this species can readily be distinguished by (1) the extremely short terminal palpal segments, (2) the longer and exceedingly slender ocular tubercle—which is even more slender in the other specimens than in the holotype, and (3) the small number of spinules on the fingers of the chela. In the latter respect it approaches *N. proximum*, Calman (1915, p. 34, fig. 6 D), but the palm is longer and more slender, the fingers more curved distally and the spinules longer; the ocular tubercle is 4–6 times as high as wide instead of only as high as wide; the setae are much longer.

C. SPECIES OF UNCERTAIN SYSTEMATIC POSITION

Nymphon multidens, n.sp. (Figs. 34 and 35).

St. 456. 18. x. 30. 1 mile E of Bouvet Island, 40–45 m. Large dredge: 1 ♀ (holotype).

Description of holotype (♀). *Trunk* rather compact; lateral processes separated by half their own diameter or rather more. Cephalic segment equal to the sum of the three posterior segments; neck rather long, base of oviger in contact with first lateral process. Ocular tubercle as high as wide, rounded; eyes well developed. Setae absent (Fig. 34).

Proboscis short, sub-cylindrical, rounded at apex; much shorter than cephalic segment, and two-thirds of scape.

Abdomen short, sub-cylindrical, reaching to distal end of fourth lateral process; elevated at an angle of about 40°.

Chelophore. Length of scape three times the distal width. Chela somewhat shorter than scape and of a very unusual type (Fig. 35 *d*), with immovable finger very short relative to length of palm. There are twenty-four short, crowded spinules on the movable, 26–28 on the immovable finger; setose pad short but distinct.

Palpal segments 2–5 in the proportions 4 : 3·33 : 1·5 : 2 (Fig. 35 *a*).

Oviger. Terminal claw half of tenth segment, armed with 8–10 short spinules. Total number of denticulate spines at least seventy,[1] but they are so crowded that it is difficult to count the numbers exactly (formula approximately 23 + 16 + 18 + 16 = 73); each spine is long and slender with numerous short, crowded denticulations on each side. Segments 4–6 relatively short, in the proportions 1·8 : 1·75 : 1.

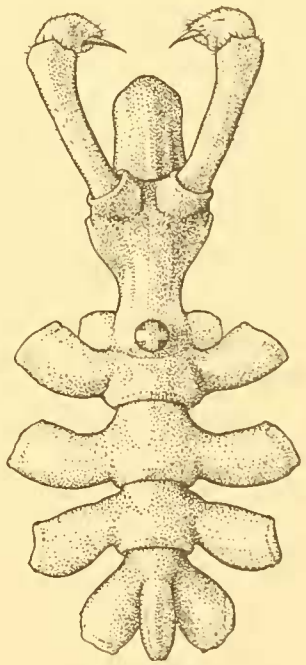

Fig. 34. *Nymphon multidens*, n.sp. Holotype. Dorsal view of body with chelophores: × 16.

Third leg. First coxa very short, second approximately half as long again as the sum of the other two (dorsal measurements). Femur equal to first tibia, not greatly distended

[1] Hence the specific name.

although containing developing ova (length six times the greatest width). Second tibia the longest segment, half as long again as femur. Tarsus half as long as propodus, ventral margin of each segment armed with numerous short spinose setae; claw short, auxiliaries relatively long (Fig. 35 *c*). Setae for the most part very minute.

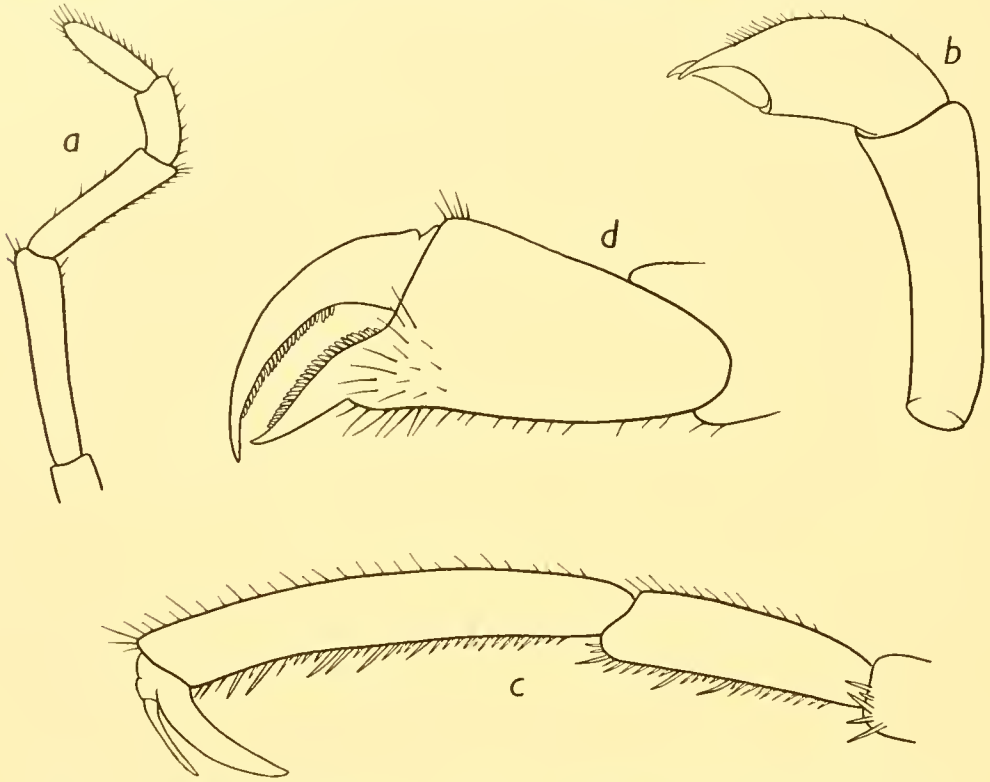

Fig. 35. *Nymphon multidens*, n.sp.: *a*. Palp. *b*. Chelophore. *c*. Terminal segments of third leg. (All × 33.) *d*. Chela: × 60.

Measurements (*mm.*)

Length of proboscis	...	...	1·0
Diameter of proboscis	...	...	0·6
Length of trunk	...	...	3·4
Length of cephalic segment	...	...	1·7
Width of cephalic lobes	...	...	0·93
Width of neck	...	...	0·5
Width across second lateral processes			2·3
Length of abdomen	...	...	0·6

Third leg:

First coxa	...	...	0·6
Second coxa	...	...	1·8
Third coxa	...	...	0·5
Femur	...	...	4·4
First tibia	...	...	4·4
Second tibia	...	...	6·7
Tarsus	...	...	1·0
Propodus	...	...	2·0
Claw	...	...	0·45
Auxiliaries	...	...	0·3

Remarks. This species differs from all other Antarctic and sub-Antarctic species as regards the chela, which recalls that of, e.g., *N. grossipes* (Fabr.) from the North Atlantic (Hoek, 1881, p. 44, pl. iii, figs. 9–12, pl. iv, fig. 1). The northern species, however, has the tarsus elongated and longer than the propodus; there are also three or four very long spines on the proximal ventral margin of the latter and the claw is much longer.

The male is unknown, but the species probably belongs to group I.

Distribution. One mile off the east coast of Bouvet Island.

D. TROPICAL SPECIES

Nymphon angolense, n.sp. (Figs. 36 and 37).

St. 272. 30. vii. 27. Off Elephant Bay, Angola, from 13° 11′ S, 12° 44′ 45″ E to 13° 09′ 45″ S, 12° 46′ E, 73–91 m.; gn. S. M. Large otter trawl: 30 specimens, including ovigerous and larvigerous ♂♂; 2 specimens bear each a small bivalve mollusc.

Description of holotype (larvigerous ♂). *Trunk* elongated and slender, lateral processes separated by more than their own diameter (Fig. 36 *a*). Cephalic segment as long as the remaining segments plus abdomen. Neck long and slender, less than half as wide as the anterior cephalic lobes; base of oviger small and rounded, in contact

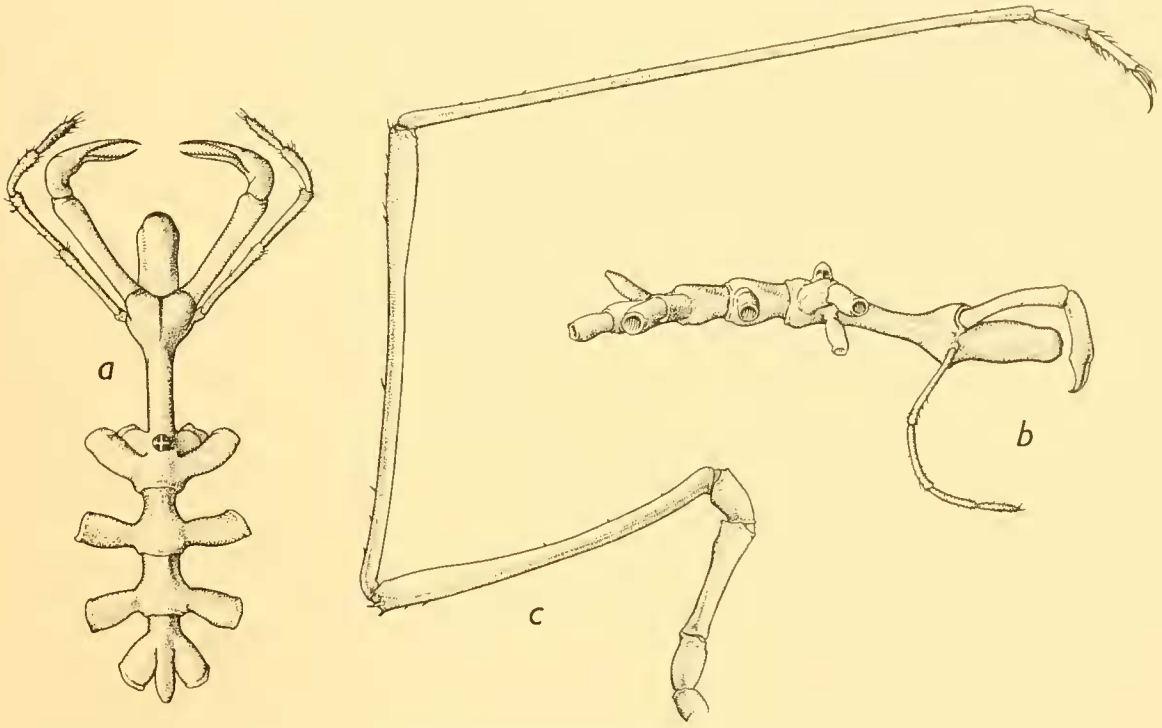

Fig. 36. *Nymphon angolense*, n.sp.: *a*. Dorsal view of body of holotype with chelophores and palps. *b*. Lateral view of body with chelophore and palp. *c*. Third leg.

with first lateral process. Ocular tubercle low and rounded; a little higher than wide, eyes conspicuous (Fig. 36 *a* and *b*).

Proboscis half as long as cephalic segment, cylindrical, rather rounded at apex.

Abdomen reaching a little beyond fourth lateral process, elevated at an angle of about 45°, approximately three times as long as broad.

Chelophore. Scape subequal to proboscis; length five times the distal width. Chela slender, rather curved and somewhat longer than scape (Fig. 37 *a*); fingers a little longer than palm, approximately forty-five crowded spinules on immovable, fifty-five on movable one.

Palp long and slender, segments 2–5 in the proportions 10 : 6 : 3 : 3·3 (Fig. 37 *b*).

Oviger long and slender. Terminal claw two-thirds of tenth segment, armed with fourteen short spinules. Total number of denticulate spines 39 (13 + 10 + 8 + 8). Segments 4–6 as represented in Fig. 37 *d*, in the proportions 2 : 2·3 : 1; segment 5 straight, of almost uniform diameter throughout, with a few hook-like spines near the distal articulation (Fig. 37 *d*).

Third leg long and slender, sparsely beset with short, spinose setae on the three main segments. Second coxa a little longer than the sum of the first and third (dorsal measurements). Femur slender and, like first tibia, expanded in the distal third (Fig. 36 *c*), more than half as long again as the three coxae together; gland openings very inconspicuous, about ten in number. Second tibia the longest segment, approximately five times the sum of tarsus and propodus. The latter slightly longer than the former and armed ventrally with six or seven spines (Fig. 37 *c*). Claw rather more than half as long as propodus; auxiliaries very long—at least two-thirds of claw.

Measurements (*mm.*)

	Holotype	♀
Length of proboscis	1·8	1·9
Diameter of proboscis	0·7	0·8
Length of trunk	6·0	5·9
Length of cephalic segment	3·6	3·6
Width of cephalic lobes	1·1	1·2
Length of neck	1·6	1·6
Width of neck	0·45	0·5
Width across second lateral processes	2·8	2·8
Length of abdomen	1·0	1·1
Third right leg:		
First coxa	1·0	0·85
Second coxa	2·0	1·6
Third coxa	1·0	0·8
Femur	6·8	7·0
First tibia	9·2	8·4
Second tibia	12·0	12·0
Tarsus	1·1	1·0
Propodus	1·3	1·2
Claw	0·8	0·75
Auxiliaries	0·55	0·5

The *female* is very similar to the male, but segments 4–5 of the oviger are relatively short. The femur is rather more robust and of almost uniform diameter throughout; the first tibia is expanded distally as in the male.

Remarks. The only species of the genus *Nymphon* previously reported from West Africa is *N. gracillimum*, Calman (Loman, 1923 *b*, p. 5). *N. angolense* differs from the holotype of that species in several respects: (1) there are at least twice as many spinules on the fingers of the chela, (2) there are a few hooked spines near the distal articulation of the fifth segment of the male oviger, (3) the tarsus does not exceed, although it may nearly equal the propodus, (4) the auxiliary claws are more highly developed, and (5) the first tibia in both sexes, and the femur in the male, is expanded distally.

N. angolense does not agree with any of the African species listed by Flynn (1928, p. 6).

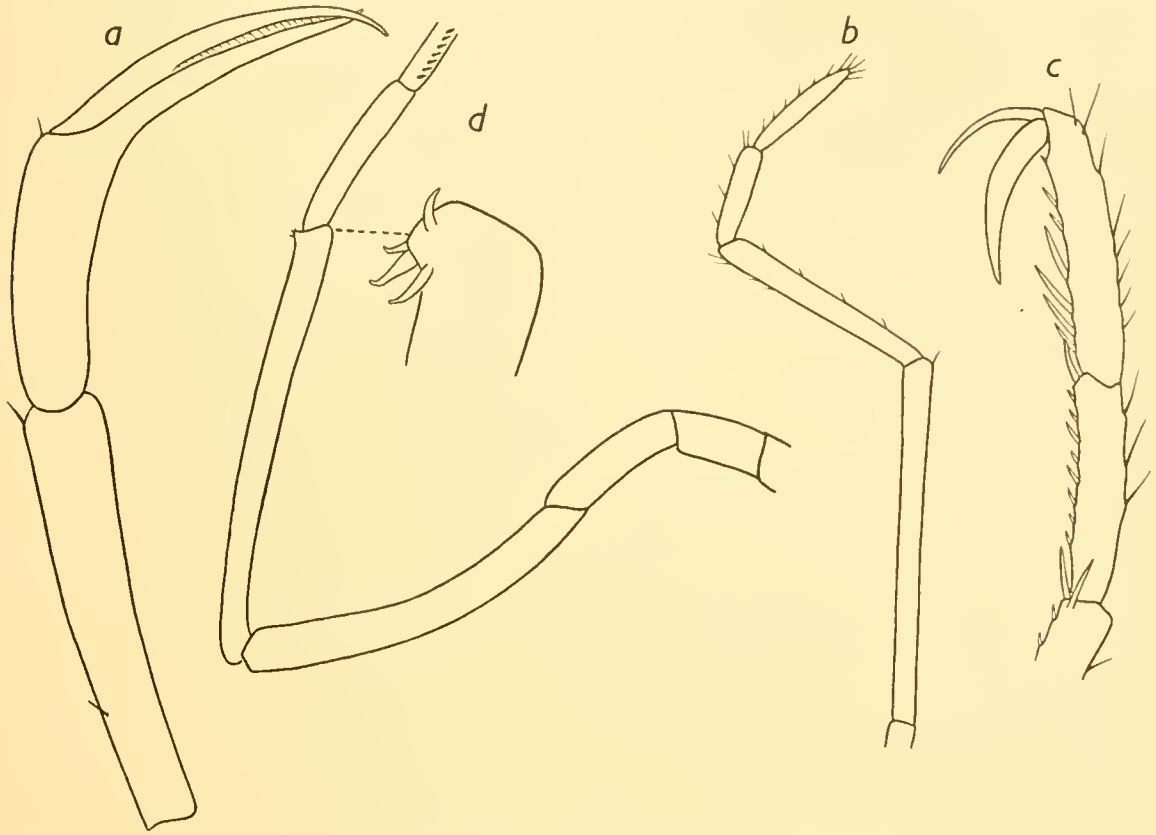

Fig. 37. *Nymphon angolense*, n.sp.: *a*. Chelophore. *b*. Palp. *c*. Terminal segments of third leg. (All × 27.) *d*. Segments 1–7 of male oviger: × 20, and distal end of fifth segment: × 60.

Genus **Heteronymphon**, n.g.

Diagnosis. Body smooth, rather compact, segmented, with well-defined lateral processes; cephalic segment with short thick neck and low wide ocular tubercle situated in front of neck and between the two anterior lobes of cephalon. Chelophores long, slender; chela not exceeding half the length of the scape. Palp five-jointed. Oviger ten-jointed with denticulate spines on the four terminal segments, but without terminal claw; fifth segment in male relatively short and considerably expanded distally (like that of group II in the genus *Nymphon*).

Remarks. In general appearance the specimens referred to this genus resemble those belonging to the smaller species of *Nymphon* with short neck, e.g. *Nymphon pfefferi*. But the anterior position of the ocular tubercle[1] and the absence of the terminal claw on the oviger separates this form from all species of the genus *Nymphon*. These two characters are also found in the genus *Nymphonella*, Ohshima (1927, p. 257), but the latter would appear to belong to the Eurycididae rather than the Nymphonidae, since the chelophore is reduced, the palp has nine segments, and the proboscis is "directed ventrad".

[1] The ocular tubercle is never situated in front of the point of insertion of the oviger in *Nymphon*.

The genus *Heteronymphon* serves to link the Nymphonidae to the Phoxichilidae (Pallenidae) on the one hand and to the Phoxichilidiidae on the other. In the former family the terminal claw of the oviger is sometimes wanting or vestigial; in the latter family the ocular tubercle is situated near the anterior border of the cephalon in, e.g., *Phoxichilidium australe*.

Loman (1908, table facing p. 19) uses the oviger as a basis for his first division of the order Pantopoda. Bouvier (1913, p. 34) has pointed out that this division into a section with and a section without a terminal claw to the oviger is not altogether satisfactory. The genus *Heteronymphon* adds yet another exception to the first section, since the terminal claw of the oviger is absent and several of the terminal denticulate spines are enlarged, presumably to take the place of the claw (Fig. 39 *d*).

Heteronymphon kempi, n.sp. (Figs. 38 and 39).

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 1 specimen, probably ♂.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 ♂, with *N. pfefferi*.

St. MS 66. 28. ii. 26. East Cumberland Bay, 2¼ miles SE of King Edward Point Light to 1½ cables W × N of Macmahon Rock, 18 m. Small beam trawl: 1 ♀ (length of trunk = 1·4 mm.) and 1 immature specimen.

St. MS 71. 9. iii. 26. East Cumberland Bay, 9¼ cables E × S to 1·2 miles E × S of Sappho Point, 60–110 m. Small beam trawl: 3 ♀♀ including holotype.

St. MS 74. 17. iii. 26. East Cumberland Bay, 1 cable SE × E of Hope Point to 3·1 miles SW of Merton Rock, 22–40 m. Small beam trawl: 1 specimen (sex uncertain, probably immature), with *N. brevicaudatum*; 1 ♀ with *N. pfefferi*.

Description of holotype (♀). *Trunk* rather compact, lateral processes separated by approximately their own diameter, articulations between the segments well marked. Cephalic segment less than half the length of the trunk, neck short and thick. Ocular tubercle low and broad, situated in front of neck near the anterior border of cephalon, eyes large (Fig. 38 *a* and *b*).

Proboscis slightly decurved, approximately as long as cephalic segment, subcylindrical, rounded at apex.

Abdomen long, slender, very much elevated.

Chelophore slender; scape rather longer than proboscis; chela not exceeding half the length of the scape, fingers scarcely longer than palm armed with fifteen and nineteen spinules respectively (Fig. 39 *b*).

Palp five-jointed; third joint the longest, one-fourth as long again as the fifth and nearly twice as long as second (Fig. 39 *a*).

Oviger ten-jointed; first three segments together somewhat longer than fourth, which is only slightly shorter than fifth. Number of denticulate spines on each of the four terminal segments five, five, four and seven (in female from MS 66 nine, six, six

and eight). There is no terminal claw, but the last three or four denticulate spines are considerably longer than the others on segment 10 (Fig. 39 *d*).

Leg with ova visible in femur and the two distal coxae. Second coxa equal to the

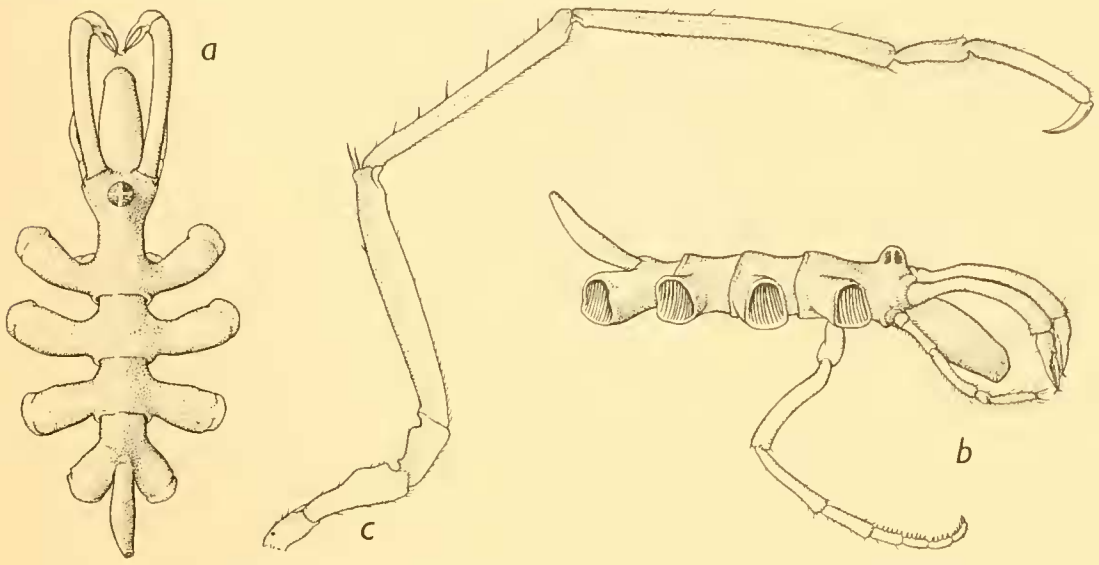

Fig. 38. *Heteronymphon kempi*, gen. et sp.n.: *a*. Holotype; dorsal view of body with chelophores. *b*. Holotype, lateral view of body with chelophores, palp and oviger. *c*. Third leg.

other two together, with a distinct prominence on the dorsal surface (Fig. 38 *c*). Femur and first tibia equal, second tibia the longest segment. Propodus nearly twice as long as tarsus and more than twice as long as the main claw. Auxiliary claws absent.

Measurements (*mm.*)

Length of proboscis	0·55
Diameter of proboscis	0·20
Length of trunk	1·25
Length of cephalic segment	0·54
Width of cephalic lobes	0·30
Width across second lateral processes	1·00
Length of abdomen (animal placed in natural position)	0·44
Third leg:	
First coxa	0·30
Second coxa	0·70
Third coxa	0·40
Femur	1·80
First tibia	1·80
Second tibia	2·20
Tarsus	0·50
Propodus	0·93
Claw	0·36

Remarks. Although the specimens are very small the genital pores are conspicuous in all the females. The largest specimen is the adult from MS 66, and it is quite probable that this female has the full number (29) of denticulate spines on the oviger for the species.

The single male specimen has both ovigers mutilated, but fortunately the fifth segment is present on one side (Fig. 39 *c*); it is relatively short compared to the fourth

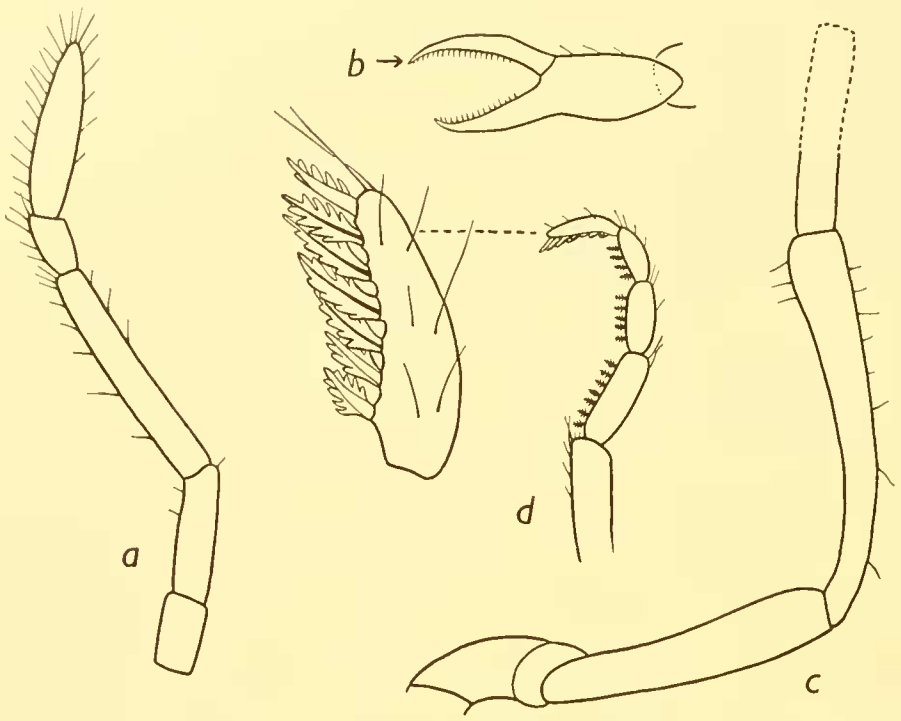

Fig. 39. *Heteronymphon kempi*, gen. et sp.n.: *a*. Palp. *b*. Chela. *c*. Segments 3–5 of male oviger—6 incomplete. *d*. Segments 7–10 of female oviger with 10th segment further enlarged—the denticulate spines are not accurately represented in the smaller figure. (*a* and *b*: ×100; *c* and *d*: × 60 and *circ.* 240.)

segment and is considerably expanded or clubbed distally as in group II of the genus *Nymphon* (cf. Figs. 39 *c* and 27).

The relative proportions of palpal segments 2–5 differ markedly from those of any Antarctic species of the genus *Nymphon*.

Family PHOXICHILIDAE (PALLENIDAE)

Genus Pallene, Johnston

Pallene margarita, n.sp. (Figs. 40 and 41).

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 3 specimens.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 3 specimens including 1 ♂ bearing ova and larvae.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 1 ♂.

St. WS 212. 30. v. 28. 49° 22′ S, 60° 10′ W, 242–249 m.; gn. S. M. Commercial otter trawl: many specimens including ovigerous ♂♂.

St. WS 214. 31. v. 28. 48° 25′ S, 60° 40′ W, 208–219 m.; f. d. S. Commercial otter trawl: 1 ovigerous ♂.

St. WS 227. 12. vi. 28. 51° 08′ S, 56° 50′ W, 320–298 m.; f. gn. S. Commercial otter trawl: many specimens including ovigerous and larvigerous ♂♂.

St. WS 228. 30. vi. 28. 50° 50′ S, 56° 58′ W, 229–236 m.; Sh. c. w. S. Commercial otter trawl: 5 specimens, including larvigerous ♂.

St. WS 229. 1. vii. 28. 50° 35′ S, 57° 20′ W, 210–271 m.; f. gn. S. Commercial otter trawl: many specimens, including ovigerous and larvigerous ♂♂.

St. WS 234. 5. vii. 28. 48° 52′ S, 60° 25′ W, 195–207 m.; f. gn. S. Commercial otter trawl: 3 specimens.

St. WS 237. 7. vii. 28. 46° 00′ S, 60° 05′ W, 150–256 m.; c. br. S. Sh. Commercial otter trawl: 1 larvigerous ♂.

St. WS 244. 18. vii. 28. 52° 00′ S, 62° 40′ W, 253–247 m.; f. d. S. M. Commercial otter trawl: 1 larvigerous ♂.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 1 ♀, 3 ovigerous and larvigerous ♂♂.

Description of holotype.[1] *Trunk* segmented, of rather loose build; lateral processes, with the exception of the last two pairs, separated by more than their own

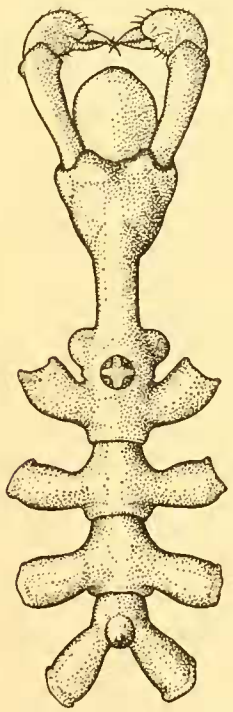

Fig. 40. *Pallene margarita*, n.sp. Dorsal view of body with chelophores: × 20.

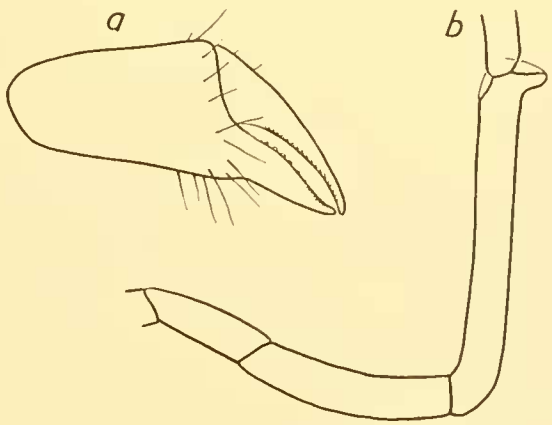

Fig. 41. *Pallene margarita*, n.sp.: *a*. Chela: × 90. *b*. Segments 3–5 of male oviger: × 33.

diameter. Cephalic segment much longer than the sum of the three posterior segments, and considerably expanded anteriorly; neck long. Ocular tubercle bluntly conical, a

[1] A larvigerous male from St. WS 229.

little higher than wide; eyes well developed. Oviger base small and situated a short distance in front of first lateral process (Fig. 40).

Proboscis short, stout, sub-cylindrical.

Abdomen short, elevated at an angle of 80–90° and reaching to middle of fourth lateral process.

Chelophore short. Scape equal to proboscis and approximately two and a half times as long as wide distally. Chela as represented in Fig. 41 *a*; movable finger equal to palm; 7–8 minute teeth on immovable one.

Palp absent (as also in the female).

Oviger. Terminal claw absent; spines on the four terminal segments short, rather broad and rounded distally, numbering 49[1] (14 + 11 + 12 + 12). Fifth segment relatively long and furnished with the usual distal lobe (Fig. 41 *b*).

Third leg. Second coxa long and slender, more than twice the sum of the first and third (dorsal measurements). Femur subequal to first tibia and at least nine times as long as wide. Second tibia the longest segment. Tarsus very small; 4–5 long spines on proximal sixth of ventral margin of propodus. Claw and auxiliaries long and slender.

In the *female* the femur is considerably dilated in the proximal two-thirds and the fifth segment of the oviger is relatively short, without the distal lateral lobe.

Measurements (*mm.*)

	Holotype	♀ (St. WS 227)
Length of proboscis	0·6	0·7
Diameter of proboscis	0·4	0·5
Length of trunk	2·6	3·0
Length of cephalic segment	1·67	2·0
Width of cephalic lobes	0·65	0·75
Width of neck	0·22	0·3
Width across second lateral processes	1·2	1·3
Length of abdomen	0·3	0·25
Third leg:		
First coxa	0·45	0·5
Second coxa	1·73	1·73
Third coxa	0·27	0·35
Femur	2·9	3·6
First tibia	2·9	3·53
Second tibia	3·6	4·4
Tarsus	0·1	
Propodus	0·93	
Claw	0·64	
Auxiliaries	0·5	

Remarks. This species appears to belong to the genus *Pallene*, but the two terminal body segments are not fused as in the majority of the other species—a condition that is also found, e.g., in *P. emaciata*, Dohrn.

The genus is seldom represented in Antarctic collections. Bouvier (1913, p. 20 and

[1] 48–56 in adults.

p. 96) mentions *P. dimorpha*,[1] Hoek, as the only Antarctic species (from Kerguelen). *P. margarita* differs from the latter chiefly in that the terminal claw of the oviger is entirely suppressed and the palp is absent in both sexes.

Genus Austropallene, Hodgson

Austropallene cornigera (Möbius) (Figs. 42 and 43).

Calman, 1915, p. 38, *ubi synon. et lit.*
Loman, 1923, p. 22.

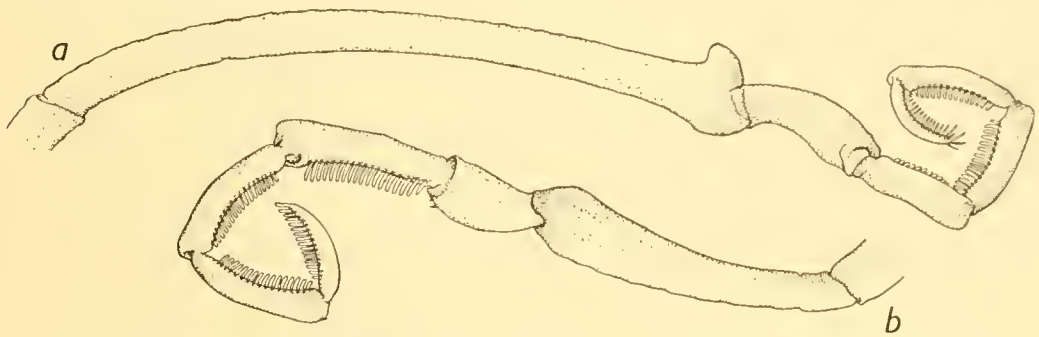

Fig. 42. *Austropallene cornigera* (Möbius). Segments 5–10 of oviger of *a*, male; *b*, female.

St. 27. 15. iii. 26. West Cumberland Bay, South Georgia, 3·3 miles S 45° E of Jason Light, 110 m.; M. R. Large dredge: 1 ♂.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 3 ♀♀.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 immature specimen probably belongs to this species.

St. 156. 20. i. 27. 53° 51′ S, 36° 21′ 30″ W, 200–236 m.; R. Large heavy dredge: 1 ♀.

St. 159. 21. i. 27. 53° 52′ 30″ S, 36° 08′ W, 160 m.; R. Large heavy dredge: 1 larvigerous ♂.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ 00″ W, 342 m.; R. Large heavy dredge: 16 specimens, including 5 ovigerous ♂♂, accompanied by the following note: "White-spotted Pycnogon. Horn-coloured. Abdomen [trunk] opposite 2 middle pairs of legs with a white dorsal patch. All legs with a white spot at distal end of segments 3, 4, 5 and 6, with, in addition, one spot at proximal end of segment 5".

St. 175. 2. iii. 27. Bransfield Strait, South Shetlands, 63° 17′ 20″ S, 59° 48′ 15″ W, 200 m.; m. St. G. Large dredge: 1 ovigerous ♂ and 1 young ? ♀.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° W, 160–335 m.; M. Large otter trawl: 1 ovigerous ♂, rather slender, but apparently this species.

[1] Schimkewitsch (1930) has established a new genus, *Oropallene*, for Hoek's species. According to Flynn (1919, p. 77) *Pallene valida*, Haswell, would also belong to *Oropallene*. Schimkewitsch appears to have carried the multiplication of genera within the family Phoxichilidae (Pallenidae) to the utmost extreme and characters such as (1) the presence or absence of auxiliary claws, (2) the fusion or non-fusion of two body segments, (3) the presence or absence of a rudimentary palp, and (4) the presence or absence of a terminal claw on the oviger assume far more importance in this than in almost any other family.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259 m.; M. Large dredge: 2 ♂♂, 1 ♀.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ 00″ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: 1 ovigerous ♂, with *Nymphon charcoti*.

St. 363. 26. ii. 30. 2·5 miles S 80° E of SE point of Zavodovski Island, South Sandwich Islands, 329–278 m.; Sc. Large dredge: 1 larvigerous ♂, 1 ovigerous ♂.

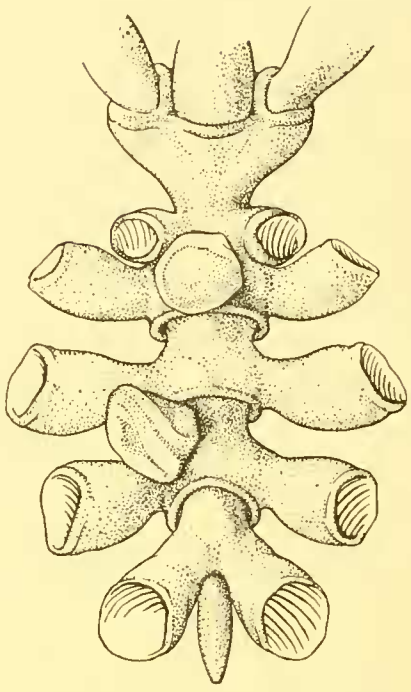

Fig. 43. *Austropallene cornigera* (Möbius). Ventral view of body showing two (?) egg-cases of some animal adhering to the epidermis.

Remarks. The white spots mentioned in the note on the label (St. 170) are still quite clear in the preserved specimens from this station and are present, though less well marked, in specimens from some of the other stations also.

The spurs on the cephalon are longer and more slender in the specimens from St. 42, 156 and 159 and the short spinous projection on each lateral process is more pronounced than is typical of the species.

Segments 5–10 of the male and female ovigers are represented in Fig. 42 *a* and *b*. The two globular bodies attached to the ventral surface of the specimen from St. 187 (Fig. 43) appear to be egg cases of some animal; they can be detached without damaging the Pycnogon and are apparently only glued on to the specimen.

Austropallene brachyura (Bouvier).

Calman, 1915, p. 39, *ubi synon. et bibl.*

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 immature specimen probably belongs to this species, but the neck is somewhat longer than is typical.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259 m.; M. Large dredge: 1 ♀.

Austropallene cristata (Bouvier).

Pseudopallene cristata, Bouvier, 1911, p. 1138; 1913, p. 102, figs. 55–59.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 1 immature specimen.

Family PHOXICHILIDIIDAE

Genus Pallenopsis, Wilson

Pallenopsis pilosa (Hoek).

Phoxichilidium pilosum, Hoek, 1881, p. 90, pl. xiii, figs. 10–13.
Pallenopsis pilosa, Hoek (1883), p. 9 (in list of species).
Pallenopsis pilosa, Hodgson, 1907, p. 15, pl. ii, fig. 2.
Pallenopsis pilosa, Bouvier, 1911, p. 1139; 1913, p. 107, figs. 60 and 61.

St. 170. 23.ii.27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 1 ♂, 1 ?♀ (genital pores not formed), 1 young specimen.

St. 177. 5.iii.27. 27 miles SW of Deception Island, South Shetlands, 63° 17′ 30″ S, 61° 17′ W, 1080 m.; M. c. St. Large dredge: 1 immature specimen, with *Nymphon brevicaudatum*.

St. 180. 11.iii.27. 1·7 miles W of N point of Gand Island, Schollaert Channel, Palmer Archipelago, 160–330 m.; M. St. Large otter trawl: 1 immature specimen with *N. australe*.

St. 181. 12.iii.27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; M. Large otter trawl: 1 ♂, 4 immature specimens.

St. 182. 14.iii.27. Schollaert Channel, Palmer Archipelago, 64° 21′ S, 62° 58′ W, 278–500 m.; M. Large otter trawl: 1 ovigerous ♂, 1 ♀, 1 immature specimen.

St. 187. 18.iii.27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259–354 m.; M. Large otter trawl: 1 ♂, 1 ♀, 1 immature specimen.

St. 190. 24.iii.27. Bismarck Strait, Palmer Archipelago, 64° 56′ S, 65° 35′ W, 315 m.; M. R. Large dredge: 1 ♀ (with small Cirripede attached).

St. 458. 19.x.30. 7 miles S 50° W of Cape Circumcision, Bouvet Island, 357–377 m. Large dredge: 1 ♂ with *N. australe*.

Remarks. The majority of the specimens are rather more compactly built and more hairy than the types, with which they agree in other respects. Several of the specimens are light brown, the others being of a pale yellowish colour.

Measurements (*mm.*)

	St. 182, ♂ (ovig.)	St. 190 ♀
Length of proboscis[1]	3·4	4·0
Diameter of proboscis[1]	1·4	1·65
Length of trunk	6·2	7·2
Width across second lateral processes	4·8	5·2
Length of cephalic segment	3·6	4·0
Length of abdomen	3·6	4·4
Length of scape	2·0 + 1·8	2·4 + 2·4
Length of chela	1·87	2·0
Third leg:		
First coxa	1·6	1·6
Second coxa	3·2	3·2
Third coxa	1·07	1·2
Femur	7·6	10·4
First tibia	7·6	10·0
Second tibia	9·2	12·0
Tarsus	0·3	0·5
Propodus	2·6	3·0
Claw	1·8	2·0
Auxiliaries	0·67	

[1] Measured laterally, not dorsally as in other species.

DISTRIBUTION. Eastern and Western Antarctic; from deep water at lat. 46° 16′ S, long. 48° 27′ E and lat. 53° 55′ S, long. 108° 35′ E.

Pallenopsis patagonica (Hoek) (Fig. 44).

Phoxichilidium patagonicum, Hoek, 1881, p. 84, pl. xii, figs. 6–9.
Phoxichilidium patagonicum var. *elegans*, Hoek, 1881, p. 86, pl. xii, fig. 10.
Pallenopsis hiemalis, Hodgson, 1907, p. 17 in part—? not the type specimen.
? *Pallenopsis glabra*, Möbius, 1902, p. 184, pl. xxvii, figs. 1–6. Bouvier, 1913, p. 109, figs. 62–65.
Pallenopsis glabra, Hodgson, 1907, p. 11; Calman, 1915, p. 41.

St. 140. 23. xii. 26. Stromness Harbour to Larsen Point, South Georgia, from 54° 02′ S, 36° 38′ W to 54° 11′ 30″ S, 36° 29′ W, 122–136 m.; gn. M. St. Large otter trawl: 1 ♂, 2 ♀♀.

St. 167. 20. ii. 27. Off Signy Island, South Orkneys, 60° 50′ 30″ S, 46° 15′ W, 244–344 m.; gn. M. Large otter trawl: 1 ♂ with encrusting Polyzoa.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259–354 m.; M. Large otter trawl: 1 large ♀.

St. 190. 24. iii. 27. Bismarck Strait, Palmer Archipelago, 64° 56′ S, 65° 35′ W, 93–315 m.; M. R. Large rectangular net: 1 ♀.

St. WS 83. 24. iii. 27. 14 miles S 64° W of George Island, East Falkland Island, from 52° 28′ S, 60° 06′ W to 52° 30′ S, 60° 09′ 30″ W, 137–129 m.; f. gn. S. Sh. Commercial otter trawl: 3 ♀♀, 2 immature specimens.

St. WS 84. 24. iii. 27. 7½ miles S 9° W of Sea Lion Island, East Falkland Island, from 52° 33′ S, 59° 08′ W to 52° 34′ 30″ S, 59° 11′ W, 75–74 m.; c. S. Sh. St. 1 ovigerous ♂, egg-mass simple but attached to both ovigers: 6 small specimens, including 2 ♂♂ (1 ovigerous) and 1 ♀ with genital pores open, may belong to this species. Several of the specimens carry encrusting Polyzoa.

St. WS 85. 25. iii. 27. 8 miles S 66° E of Lively Island, East Falkland Island, from 52° 09′ S, 58° 14′ W to 52° 08′ S, 59° 09′ W, 79 m.; S. Sh. Commercial otter trawl: 7 specimens, very hairy; 1 ♀ has the genital pores visible, the others are probably all immature.

St. WS 88. 6. iv. 27. 54° 00′ S, 64° 57′ 30″ W, from 54° 00′ S, 65° 00′ W to 54° 00′ S, 64° 55′ W, 118 m.; S. Sh. St. Commercial otter trawl: 1 ♀ and ? 1 very young specimen with a long tapering point to ocular tubercle.

St. WS 91. 8. iv. 27. 52° 53′ 45″ S, 64° 37′ 30″ W, from 52° 54′ 30″ S, 64° 39′ W to 52° 53′ S, 64° 36′ W, 191–205 m.; f. d. S. Sh. Commercial otter trawl: 1 ♀.

St. WS 92. 8. iv. 27. 51° 58′ 30″ S, 65° 01′ W, from 52° 00′ S, 65° 00′ W to 51° 57′ S, 65° 02′ W, 145–143 m.; f. d. S. St. Commercial otter trawl: 2 ♂♂, 1 ovigerous with a single egg-mass carried by both ovigers.

St. WS 93. 9. iv. 27. 7 miles S 80° W of Beaver Island, West Falkland Island, from 51° 51′ S, 61° 30′ W to 51° 54′ S, 61° 30′ W, 133–130 m.; gy. S. Commercial otter trawl: 4 small specimens, including 2 ♂♂ (1 ovigerous), bearing adherent Foraminifera.

[1]St. WS 210. 29. v. 28. 50° 17′ S, 60° 06′ W, 161 m.; gn. S. Commercial otter trawl: 1 ♀.

St. WS 214. 31. v. 28. 48° 25′ S, 60° 40′ W, 208–219 m.; f. d. S. Commercial otter trawl: 1 specimen.

St. WS 215. 31. v. 28. 47° 37′ S, 60° 50′ W, 219–146 m.; f. gn. S. Commercial otter trawl: 1 specimen.

[1] The specimens from WS 210 to the end of the list probably belong to this species; they are mostly of small size and compact build.

St. WS 225. 9. vi. 28. 50° 20′ S, 62° 30′ W, 162–161 m.; gn. S. Sh. Commercial otter trawl: 1 specimen.

St. WS 234. 5. vii. 28. 48° 52′ S, 60° 25′ W, 195–207 m.; f. gn. S. Commercial otter trawl: 1 ovigerous ♂.

St. WS 237. 7. vii. 28. 46° 00′ S, 60° 05′ W, 150–256 m.; c. br. S. Sh. Commercial otter trawl: 3 specimens (1 was apparently undergoing a moult when captured).

St. WS 243. 17. vii. 28. 51° 06′ S, 64° 30′ W, 144–141 m.; c. d. S. Commercial otter trawl: 1 ovigerous ♂.

St. WS 244. 18. vii. 28. 52° 00′ S, 62° 40′ W, 253–247 m.; f. d. S. M. Commercial otter trawl: 3 ♀♀, 2 immature specimens.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 5 ♀♀, 3 ♂♂ (2 ovigerous) and several young specimens.

St. WS 246. 19. vii. 28. 52° 25′ S, 61° 00′ W, 267–208 m.; c. gn. S. P. Commercial otter trawl: 4 specimens, including 1 ovigerous ♂.

Remarks. Calman, 1915, p. 42, has suggested that *Phoxichilidium patagonicum*, Hoek, is identical with *Pallenopsis glabra*, Möbius. All the syntypes in the Challenger collection are females; the genital pores are quite distinct in all, although the oviger is not fully developed in the smallest individual. Calman has also commented on the compactness of the body in the Challenger specimens as compared with the Terra Nova material described as *Pallenopsis glabra*.

The material in the Discovery collection is, for the most part, of the compact type and was also collected from the Falkland Island area. The largest specimens from this region, e.g. the adult from WS 88, is very similar to the largest Challenger syntype. The small specimens tend to have the lateral processes but little separated and to have rather long fine setae on the walking legs. The smallest specimen from the more southern region (that from St. 190, length = 9·5 mm.) also has the lateral processes of the body but little separated and setose legs. The largest specimens (Sts. 140 and 187) have the lateral processes separated by a distance equal to their own diameter.

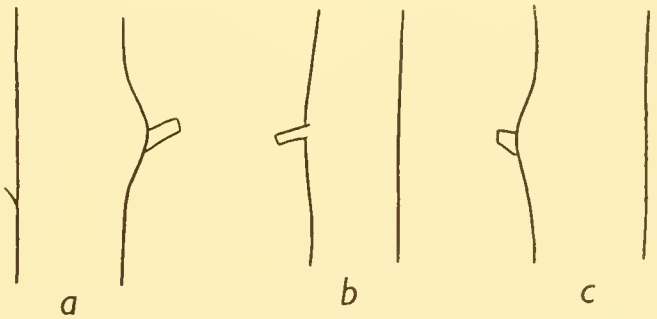

Fig. 44. *Pallenopsis patagonica* (Hoek). Femoral gland-tubercle of male. *a*. Trunk length = 11·2 mm., St. WS 92. *b*. A smaller specimen from St. WS 84. *c*. Trunk length = 10·7 mm. from St. WS 92.

Although this species reaches a considerable size in the more southern, colder region, the males reach maturity early and carry ova when they have reached a length of 7–7·5 mm. (from ocular tubercle to tip of abdomen). The genital pores, also, are formed in the females when they reach a length of about 8–9 mm., but the ovigers are not fully developed until later. Even in adult females two of the four terminal segments (7 and 8) are nearly always more or less fused together, as figured by Bouvier (1913, p. 111, fig. 64).

The femoral gland is quite prominent in small males (Fig. 44); in the two males from WS 92 it is situated on a raised mound[1] (Fig. 44 *a*, *c*), but is much shorter in one specimen than in the other. In the male specimen of the first Discovery Expedition, described by Hodgson under *P. hiemalis*, 1907, p. 19, the femoral gland is still shorter, and in the male from St. 140 it is not visible to the naked eye.

Table VII

Specimen	Station	Length of trunk plus abdomen in mm.	Relative lengths of segments 2–6 of oviger				
			2	3	4	5	6
♂	167	12·0	1	0·84	1·66	1·93	0·89
♂	140	15·0	1	0·78	1·38	1·38	0·70
♂	WS 93	9·0	1	0·87	1·60	1·60	0·80
♂	WS 92	11·2	1	0·77	1·20	1·20	0·62
♂	Valdivia	?	1	0·50	0·93	1·30	0·58
♀	Valdivia	16·0	1	0·93	1·19	1·19	0·73
♀	187	17·3	1	0·81	1·31	0·89	0·65
♀	140	14·8	1	0·80	1·32	1·16	0·68
♀	Challenger syntype	12·2	1	0·70	1·06	0·81	0·56

Table VIII

Specimen	Station	Length of trunk plus abdomen in mm.	Third right leg (length of segments in mm.)		
			Femur	Tibia 1	Tibia 2
♀	187	17·3	18·8	14·7	22·3
♂	140	15·0	17·4	15·1	23·1
♀	140	14·8	19·6	15·6	24·4
♀	190	9·4	9·6	8·5	11·4
?♀	WS 84	7·4	6·75	6·75	9·4
?♀	WS 93	8·0	8·6	8·3	10·7

The type specimen of *P. hiemalis* differs from all specimens of *P. patagonica* examined (1) in the size and arrangement of the spines on the ventral surface of the propodus (cf. Hodgson, 1907, pl. ii, figs. 3, 3 *a*), (2) in having a very well-developed tubercle on each lateral process, and (3) in having relatively longer and narrower vestiges of the palps. Most specimens of *P. patagonica* have 2–4, generally three, very long spines at the proximal end of the propodus and the rest are very small; whereas in the type of *P. hiemalis* (♀) the spines on the propodus are all of uniform size. The specimens from St. 140, however, exhibit an intermediate condition, the proximal six or more spines being relatively long, the others decreasing gradually in size.

Distribution. Eastern and Western Antarctic and Magellan District.

Pallenopsis spicata, Hodgson.

Hodgson, 1914–15, p. 146.
Calman, 1915, p. 44, text-fig. 9.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 1 immature specimen.

[1] Also in males from WS 210 to the end of the list.

Remarks. This is undoubtedly an immature specimen of *P. spicata*, Hodgson. It agrees in most respects with the Terra Nova specimen; the following differences are doubtless mostly due to the fact that the specimen is not fully developed. (1) The lateral processes are less widely separated, so that the cephalic segment is slightly longer than the sum of the two succeeding segments. (2) The oviger is not fully developed, is shorter than the proboscis and divided into only four segments. (3) The walking legs are relatively short (6·7 instead of 9 times the trunk length), and the spinules are set on higher tubercles.

Measurements (*mm.*)

Length of proboscis	2·8	Third leg:	
Greatest width of proboscis	1·5	First coxa	1·0
Length of cephalic segment	2·6	Second coxa	3·2
Width of anterior cephalic lobes	2·4	Third coxa	0·8
Length of trunk	5·2	Femur	8·0
Width across second lateral processes	5·07	First tibia	7·2
Length of abdomen	1·7	Second tibia	10·8
		Tarsus	0·27
		Propodus	2·4
		Claw	1·2

Distribution. Previously recorded from Gauss winter quarters and McMurdo Sound.

? Pallenopsis sp. (Fig. 45).

St. 256. 23. vi. 27. 35° 14′ S, 6° 49′ E, 850–1100 (–0) m. Young fish trawl: 1 immature specimen. Pelagic pycnogon!

Description. *Trunk* distinctly segmented; lateral processes separated proximally by narrow intervals, distally by rather more than their own diameter. Cephalic segment equal to the sum of the three posterior segments; cephalon little produced over base of proboscis, occupying about half the length of cephalic segment, scarcely wider than long. Ocular tubercle as high as its basal diameter, recumbent, nearly as wide as cephalon; eyes small, rounded and prominent, apparently reduced to one pair (Fig. 45 *c*).

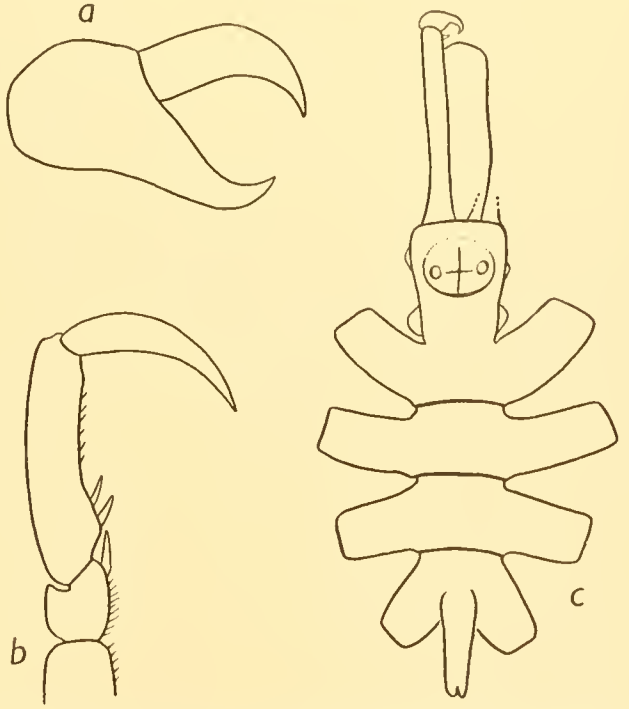

Fig. 45. ? *Pallenopsis*, sp. Young: *a*. Chela: × 100. *b*. Terminal segments of walking leg: × 60. *c*. Dorsal view of body with left chelophore: × 27.

Proboscis long, slender, slightly expanded in middle and again at apex, almost equal in length to scape.

Abdomen long, sub-cylindrical, blunt, almost vertical.

Chelophore long and slender.[1] Scape distinctly two-jointed, the first nearly twice as long as the second segment. Chela small; fingers longer than palm, gaping when closed (Fig. 45 *a*).

Palp an elongated papilla between base of chelophore and oviger.

Oviger already ten-jointed, although segments 9 and 10 are not completely separated off from each other; reaching to tip of proboscis when straightened out. The right oviger is bifurcated near the tip (Fig. 74 *c*).

Third leg long and slender. Second coxa half as long again as the sum of the first and third. Second tibia shorter than either of the two preceding segments; first tibia the longest segment. Tarsus very short, propodus with two prominent spines proximally on the ventral margin. Claw long, auxiliaries absent (Fig. 45 *b*). There are no setae on the trunk and only a few spinose setae near the distal end of the leg.

Measurements (*mm.*)

		Third leg:	
Length of proboscis	1·07	First coxa	0·4
Diameter of proboscis near tip	0·3	Second coxa	1·2
Length of trunk	1·8	Third coxa	0·4
Width across second lateral processes	1·35	Femur	3·24
Length of cephalic segment	0·85	First tibia	3·5
Width of cephalon	0·47	Second tibia	2·87
Length of abdomen	0·5	Tarsus + propodus	0·7
Length of scape	1·2	Claw	0·35

Remarks. This specimen is not quite mature, no genital pores can be distinguished. It appears to belong to the genus *Pallenopsis*, but does not belong to any of the species previously recorded from South African waters. There can be no doubt that the species is pelagic, for the total depth at the locality in which this specimen was obtained exceeds 4000 m.[2] No pelagic species of *Pallenopsis* appears to have been previously described, but Flynn (1928, p. 25) has described a pelagic species of *Anoplodactylus* from off Port Natal.

The specimen probably belongs to a small species characterized by (1) the almost complete absence of setae, (2) the complete suppression of the auxiliary claws on the legs, and (3) the presence of but one pair of eyes.

Genus Phoxichilidium, Milne-Edwards

Phoxichilidium australe, Hodgson.

Hodgson, 1915, p. 145.
Calman, 1915, p. 46, fig. 10 A–D.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 2 ♀♀.

St. 187. 18. iii. 27. Neumayr Channel, Palmer Archipelago, 64° 48′ 30″ S, 63° 31′ 30″ W, 259–354 m.; M. Large otter trawl: 1 ♂.

[1] Length of scape eight to nine times the distal width.

[2] The specimen could not have got into the net from dredged material obtained elsewhere: for nearly two months prior to its capture plankton nets only were in use.

St. 190. 24. iii. 27. Bismarck Strait, Palmer Archipelago, 64° 56′ S, 65° 35′ W, 93–126 m.; R. Large dredge: 1 ♀, 1 ♂, 1 ovigerous ♂.

Distribution. Previously recorded from the Gauss winter quarters and McMurdo Sound.

Family ENDEIDAE

Genus Endeis, Philippi

Endeis australis (Hodgson).

Phoxichilus australis, Hodgson, 1907, p. 5, pl. i, fig. 1.
Phoxichilus australis, Bouvier, 1913, p. 118, text-fig. 74.
Endeis australis, Calman, 1915, p. 49, text-fig. 11.

St. 174. 28. ii–2. iii. 27. Deception Island, South Shetlands, outside entrance W of Light, 5–10 m. In fish trap: 1 ovigerous ♂.

Remarks. This specimen has been referred to *Endeis australis* because, although smaller and of more compact build with shorter stouter legs than is typical for the species, it shows no distinctive differences that might be deemed of specific importance.

The oviger appears to have only seven segments both in the Discovery specimen and in the Terra Nova specimen for which measurements are given below (cf. Bouvier, 1913, p. 119, fig. 74).

Calman (1915, p. 49) states that the orifices of the cement glands could not be discerned in the male specimens, but in the male from Terra Nova St. 314 there are 30–35 small whitish papillae in linear series on the proximal three-fourths of the posterior surface of *each* walking leg (cf. Bouvier, 1913, p. 119: "Les orifices des glandes à cément sont situés sur de petites saillies qui forment une rangée longitudinale à la face postérieure des pattes des trois dernières paires"). These papillae are also present on all four legs in the Discovery specimen, but are fewer in number (20–25 on each femur).

Measurements (*mm.*)

	Terra Nova St. 314, ♂	Discovery St. 174, ♂
Length of proboscis	2·93	2·0
Diameter of proboscis	0·8	0·67
Length of trunk	4·0	2·93
Width across second lateral processes	3·0	2·4
Length of cephalic segment	1·33	1·1
Length of trunk ÷ length of proboscis	1·36	1·47
Third leg:		
First coxa	0·8	0·6
Second coxa	2·8	1·6
Third coxa	0·8	0·6
Femur	7·2	4·0
First tibia	6·8	3·4
Second tibia	8·2	4·53
Tarsus and propodus	2·2	1·9
Claw	0·9	0·67
Auxiliaries	0·42	0·4
Length of second coxa ÷ length of first and third coxae ...	1·75	1·33
Length of second coxa ÷ greatest width of second coxa	3·5	2·4

Distribution. Antarctic: (1) Ross Sea area; (2) Margaret Bay, near Doumer Island, Palmer Archipelago, and South Shetlands.

Family AMMOTHEIDAE

Genus Ammothea, Leach

Ammothea, Leach, 1814, p. 33. Bouvier, 1913, p. 123. Calman, 1915, p. 49.
Leionymphon, Möbius, 1902, p. 183. Hodgson, 1907, p. 39.

The total number of specimens belonging to the genus *Ammothea* represents a small percentage of the entire collection, yet no fewer than five new species, each with one or two well-defined characters, are represented. Of these *A. tetrapora* is unique in having four, instead of the usual two pairs of male genital openings. Two species have each an eight-jointed palp as in the genus *Achelia* (see Bouvier, 1913, p. 122, key), but they are of much larger size, and the high transverse body ridges characteristic of the genus *Ammothea* are present. Two species, both of large size, retain the chelate chelophore in the adult (*A. gigantea* and *A. striata*).

The proboscis varies greatly in relative length and in shape from species to species. As a rule it is straight, though much curved in *A. striata*, and either pyriform or subcylindrical. In three different forms (*A. longispina*, Fig. 51, *A.* sp.? and *A. stylirostris*, Fig. 56) it is widest at the base, which is surrounded by a distinct collar, and then tapers gradually to a rather narrow point,[1] forming a long piercing organ or probe. A similar type of proboscis is found in the genus *Austroraptus*, where it is much more abruptly narrowed in the distal half.

The definition of the genus given by Hodgson and earlier writers requires considerable modification and enlargement. The chief characters of the genus are given below, followed by a key to the determination of the Antarctic and sub-Antarctic species.

Trunk rather compact, with distinct transverse body-ridges often greatly elevated in the centre; lateral processes in contact or separated by intervals up to their own diameter. Cephalon broad, neck very short or wanting; ocular tubercle situated a short distance behind the anterior border; eyes present.

Proboscis cylindrical, pyriform or gradually tapering distally (styliform).

Chelophore chelate in immature specimens, usually, but not always, with reduced chela in adult; scape single-jointed.

Palp eight- or nine-jointed.

Oviger ten-jointed, without terminal claw; sometimes an irregular series of special spines on the last four segments. In the male the seventh segment is very short, setose, and much wider than the three terminal segments.

Legs rather stout as a rule; second tibia usually the longest segment (the femur is longest in *A. gigantea*, the first tibia in *A. spinosa*); tarsus very short; propodus usually armed with a few stout spines on the proximal ventral margin; auxiliaries present. The genital apertures occur in the male on the two posterior pair of legs (on all four legs in *A. tetrapora*); in the female on all the legs.

[1] This form is designated "styliform" in the key.

KEY TO THE DETERMINATION OF THE ANTARCTIC AND SUB-ANTARCTIC SPECIES OF *AMMOTHEA*

I. Chela large and perfect in the adult as well as in immature specimens [palp nine-jointed; transverse body ridges high; species of large size].

A. Proboscis sub-cylindrical, rather slender and much curved, equal to trunk; chela slightly longer than scape; palpal segments 2 and 4 subequal; second tibia the longest segment; no large spines on ventral margin of propodus .....*A. striata* (Möbius)

B. Proboscis straight, massive and somewhat pyriform, not quite three-fourths of trunk; chela half as long as scape; palpal segment 4 rather longer than 2; *femur* the longest segment; two spines on proximal ventral margin of propodus, the larger just over one-third of main claw .....*A. gigantea*, n.sp.

II. Chela large and perfect in immature specimens, imperfect and much reduced in adults.

A. Palp eight-jointed [transverse body ridges prominent, each rising in centre to an acutely conical process; two spines on proximal ventral margin of propodus; second tibia the longest segment].

I. Proboscis not quite two-thirds of trunk, bluntly conical; chelophore half as long as, palp rather longer than, proboscis; cephalic segment approximately equal to the sum of the three succeeding segments; larger spine on propodus scarcely half as long as main claw; male genital openings present on *all four legs*.....*A. tetrapora*, n.sp.

[II. Proboscis slightly shorter than trunk, styliform; chelophore one-third of, palp rather shorter than, proboscis; larger spine on propodus half of main claw; cephalic segment equal to the sum of the two succeeding segments .....*A.* sp.? St. WS 216[1]]

III. Proboscis rather longer than trunk, styliform; chelophore scarcely one-third, palp not more than two-thirds, of proboscis; larger spine on propodus four-fifths of main claw; cephalic segment scarcely equal to the sum of the two succeeding segments .....*A. longispina*, n.sp.

B. Palp nine-jointed [and longer[2] than proboscis].

I. Transverse body ridges prominent, each, as a rule, rising in centre to at least the height of the ocular tubercle.

A. First tibia the longest segment; propodi of first and second markedly different from those of the third and fourth legs [claw almost two-thirds of propodus; proboscis scarcely as long as trunk, sub-cylindrical with a slight median constriction] .....*A. spinosa* (Hodgson)

B. Second tibia the longest segment; propodus similar for all four legs.

1. Palpal segments 5–8 serrated ventrally [segments 2 and 4 subequal; proboscis at least as long as trunk, pyriform; 4–6 small spines on proximal half of ventral margin of propodus] .....*A. minor* (Hodgson)
(*A. gracilipes*, Bouvier)

2. Palpal segments 5–8 cylindrical, not serrated ventrally.

a. Proboscis not exceeding three-fourths of trunk.

i. Proboscis sub-cylindrical; chelophore two-thirds of proboscis [palp longer than proboscis, segments 2 and 4 subequal; 3–4 spines on proximal half of ventral margin of propodus, the larger just over one-half of claw which is two-thirds of propodus] .....*A. calmani*, n.sp.
(*A. striata*? Calman)

[1] This form is inserted here as the palp is apparently not quite normal and might prove to be eight-jointed.

[2] Palp not quite normal—may be longer or at least equal to proboscis in *A.* sp.? St. WS 216.

ii. Proboscis styliform; chelophore not exceeding one-third of proboscis [fourth palpal segment the longest].

α. Palp longer than proboscis and segment 4 almost twice as long as 2; two small proximal and one median spine on ventral margin of propodus; claw less than half of propodus; cephalic segment almost equal to the sum of the three succeeding segments *A. stylirostris*, n.sp.

β. Palp slightly shorter[1] than proboscis and segment 4 almost half as long again as 2; two proximal spines on ventral margin of propodus, the longer at least half of main claw which again exceeds half of the propodus; cephalic segment equal to the sum of the two succeeding segments ..... *A.* sp.? St. WS 216

b. Proboscis equal to or longer than trunk [straight, pyriform or subcylindrical].

i. Palpal segment 2 almost half as long again as 4; numerous long, fine hairs on walking legs; chelophore at least half as long as proboscis with long slender scape ..... *A. meridionalis*, Hodgson

ii. Palpal segment 4 equal to or longer than 2; setules but no hairs on walking legs; chelophore not exceeding one-fourth of proboscis in adults, scape short and stout [2–4 spines on proximal ventral margin of propodus, the longest not quite half of main claw].

α. Palpal segment 4 equal to, or rather longer than, 2 (1–1·45 : 1) *A. glacialis* (Hodgson)

β. Palpal segment 4 almost twice as long as 2 ..... *A. carolinensis*, Leach[2] (*A. grandis*, Pfeffer) and *A. gibbosa*, Möbius

II. Transverse body ridges low, without median processes [proboscis longer than trunk, pyriform; chelophore not exceeding one-third of, palp longer than, proboscis; second tibia the longest segment; auxiliaries two-thirds of main claw, which is half of proboscis; species of small size].

A. Abdomen sub-vertical, in contact with posterior border of third segment; 3–4 small spines on proximal ventral margin of propodus, the longest rather more than one-third of main claw..... *A. clausi*, Pfeffer

B. Abdomen oblique, separated by a short distance from posterior border of third segment; 5 small spines on proximal ventral margin of propodus, subequal and about one-fourth of main claw ..... *A. australis*, Hodgson

Ammothea striata (Möbius) (Fig. 47 *b*).

Leionymphon striatum, Möbius, 1902, p. 183, pl. xxvi, figs. 7–12.

Ammothea striata, Bouvier, 1913, p. 124, figs. 75–77 (*nec A. striata?*, Calman, 1915, p. 55).

St. 167. 20. ii. 27. Off Signy Island, South Orkneys, 60° 50′ 30″ S, 46° 15′ W, 244–344 m.; gn. M. Large otter trawl: 1 ♂, largely overgrown with Polyzoa and *Alcyonidium*.

Remarks. This species retains the chelate chelophore in the adult, as figured by Bouvier (1913, p. 125, fig. 75).[3] The scape is not quite half the length of the proboscis

[1] Palp not quite normal—may be longer or at least equal to proboscis in *A.* sp.? St. WS 216.

[2] There is very little difference between *A. carolinensis* and *A. gibbosa* (see Bouvier, 1913, pp. 123, 129 and Calman, 1915, p. 52). *A. clausi* and *A. australis* also are very similar; future investigations may result in uniting the two forms in either or both of these cases.

[3] See Calman, 1915, p. 56, on this point; the specimen is mature.

and 2·33 times as long as wide distally. The chela is slightly longer than the scape, the fingers curved and gaping when closed.

The proboscis is markedly curved and at least as long as the trunk if allowance is made for the curvature.

A. striata is most nearly related to *A. gigantea*, n.sp., which also retains the chelate chelophore in the adult. It is easily distinguished from the latter by (1) the rather slender curved proboscis; (2) the more massive chelophore, with chela even longer than the scape; (3) the absence of large spines on the propodus; and (4) the longer second tibia (see key, and table on p. 99).

Measurements (mm.)

		Third leg:	
Length of proboscis	15·0 +	First coxa	2·7
Diameter of proboscis	2·5	Second coxa	8·0
Length of trunk	15·0	Third coxa	3·0
Length of cephalic segment	7·4	Femur	26·6
Width of cephalic lobes	6·7	First tibia	23·0
Width across second lateral processes	13·3	Second tibia	30·2
Length of abdomen	4·0	Tarsus and propodus ...	7·5
		Claw	3·0
		Auxiliaries	1·2

DISTRIBUTION. South of Bouvet Island, South Shetlands and South Orkneys.

Ammothea gigantea, n.sp. (Figs. 46 and 47 *a*).

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 1 ovigerous ♂ (holotype); 1 ♂, overgrown with Polyzoa, Tunicates and Hydroids, 1 ♀.

DESCRIPTION OF HOLOTYPE. *Trunk* rather compact, lateral processes separated by narrow intervals—not exceeding half of their own diameter. Transverse body-ridges

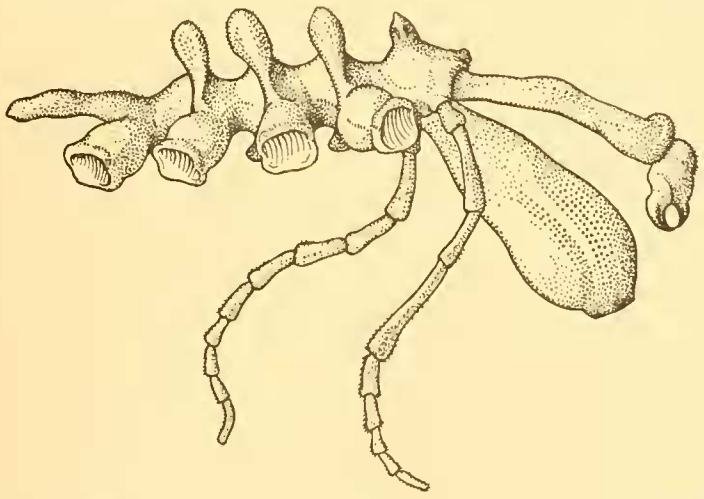

Fig. 46. *Ammothea gigantea*, n.sp. Lateral view of body with chelophore, palp and oviger: × 2.

prominent, rising in the middle line above the level of the ocular tubercle to blunt, rounded apices. Cephalic segment equal to the sum of the two succeeding segments. Ocular tubercle small, scarcely higher than wide, tapering abruptly to a point above the level of the eyes which are of approximately equal size (Fig. 46).

Proboscis very robust, almost three-fourths of trunk; maximum width near the apex (Fig. 46).

Abdomen reaching a short distance beyond fourth lateral process, slightly elevated.

Chelophore very well developed in all three adult specimens, almost as long as proboscis. Scape long and rather stout, length approximately four times the distal width. Chela short and thick set, length of palm twice the width; fingers widely gaping when closed.

Palp nine-jointed[1] as in the majority of the species of *Ammothea*; fourth segment rather longer than second (1·24 : 1); segments 1–4 together as long as proboscis; terminal segments rather setose.

Ovigers each carrying a large mass of developing ova and larvae; segments 6–10 of the usual type; segments 2–4 subequal and each slightly shorter than segment 5.

Third leg long and stout; *femur the longest segment*; second coxa slightly longer than the sum of first and third. Terminal segments as represented in Fig. 47 *a* and similar in all four limbs.

Setules arranged in distinct longitudinal bands on the legs; they also occur on the abdomen, the transverse trunk ridges, lateral processes and chelophores.

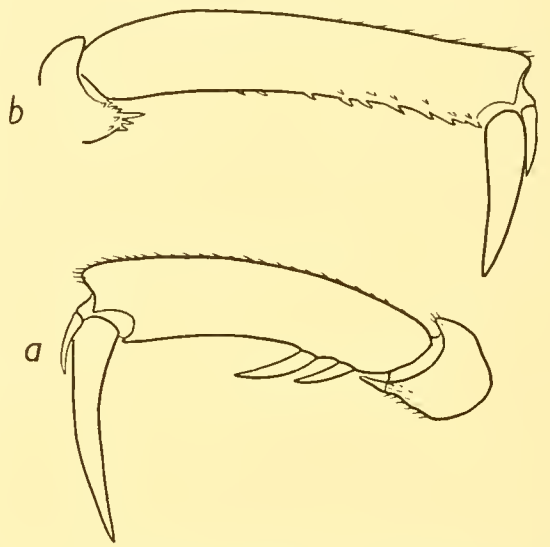

Fig. 47. Terminal segments of third leg of: *a. Ammothea gigantea*, n.sp.: ×6. *b. A. striata* (Möbius): ×8.

The *female* shows the usual sexual differences of oviger and walking legs; the femur is more robust, being scarcely more than seven times as long as wide as against nine times in the male. The setules are also fewer in number.

Measurements (*mm.*)

	♂ (holotype)	♀
Length of proboscis	16·7	19·2
Greatest width of proboscis	6·9	7·9
Length of trunk	21·8	23·0
Length of cephalic segment	9·2	10·4
Width of anterior cephalic lobes ...	7·8	7·8
Width across second lateral processes	18·9	19·2
Length of abdomen	6·9	7·3
Third leg:		
First coxa	5·0	4·4
Second coxa	10·6	11·0
Third coxa	4·2	5·4
Femur	34·0	41·2
First tibia	29·4	32·6
Second tibia	32·3	36·8
Tarsus and propodus	8·8	9·2
Claw	5·3	5·3
Auxiliaries	1·5	1·6

[1] Measurements of segments of palp: 2·4; 5·8; 3·5; 7·2; 2·4; 2·4; 2; 1·8; 2·4 mm.

Remarks. This species is the largest that has been described up to the present.

It is most closely allied to *Ammothea striata*, Möbius; in both forms the chelophore is large and the chela is perfect right up to the adult condition. The chief differences between the two species are listed in the following table.

Ammothea striata	*Ammothea gigantea*
Proboscis long, slender, curved; 6 times as long as wide and as long as trunk	Proboscis stout, straight, $2\frac{1}{2}$ times as long as wide and not exceeding four-fifths of trunk
Scape subequal to chela and less than half of proboscis	Scape twice as long as chela and three-fourths of proboscis
Second tibia the longest segment	Femur the longest segment
No large spines on proximal ventral margin of propodus, which is at least twice as long as claw	Two spines on proximal ventral margin of propodus which is only half as long again as claw

Ammothea tetrapora, n.sp. (Figs. 48, 49 and 50*a*).

St. 51. 4. v. 26. Off Eddystone Rock, East Falkland Island, from 7 miles N 50° E to 7·6 miles N 63° E of Eddystone Rock, 105–115 m.; f. S. Large otter trawl: 2 ♂♂, 2 ♀♀.

St. WS 244. 18. vii. 28. 52° 00′ S, 62° 40′ W, 253–247 m.; f. d. S. M. Commercial otter trawl: 1 larvigerous ♂ (holotype), 1 ♀.

Description of holotype. *Trunk* compact, lateral processes in contact or separated by very narrow intervals proximally. Transverse body ridges prominent, each with a high, narrow, conical median projection. Cephalic segment considerably expanded anteriorly, not quite as long as the sum of the three posterior segments. Ocular tubercle stout, scarcely higher than wide, tapering to a point above the level of the eyes; anterior much larger than the posterior eyes (Fig. 48).

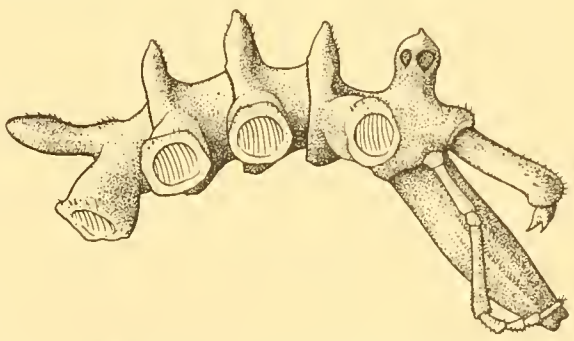

Fig. 48. *Ammothea tetrapora*, n.sp. Female. Lateral view of body with chelophore and palp: × 6.

Proboscis straight; directed obliquely downwards; widest at the base, then sub-cylindrical, narrowing distally to a blunt rounded apex; slightly more than half as long as trunk.[1]

Abdomen elevated at an angle of about 45° and reaching to distal end of fourth lateral process.

Chelophore. Scape short, club-shaped; distal width half the length. Chela small; fingers reduced and no longer capable of meeting distally.

Palp with only eight segments in all specimens; second approximately two-thirds of fourth segment. The reduction in the number of segments may be due to fusion of

[1] Measured dorsally.

the fourth and fifth joints (Fig. 49 *b*), as the longest segment sometimes has a slight constriction near the distal end but never any trace of a suture.

Oviger. The ovigers are hidden almost completely by the two clusters of larvae; one from another male is represented in Fig. 49 *a*.

Third leg. Second coxa rather longer than the sum of the first and third. Femur subequal to first and a little shorter than second tibia; approximately six times as long as wide. Terminal segments as represented in Fig. 49 *a*; similar in all four legs. Setules

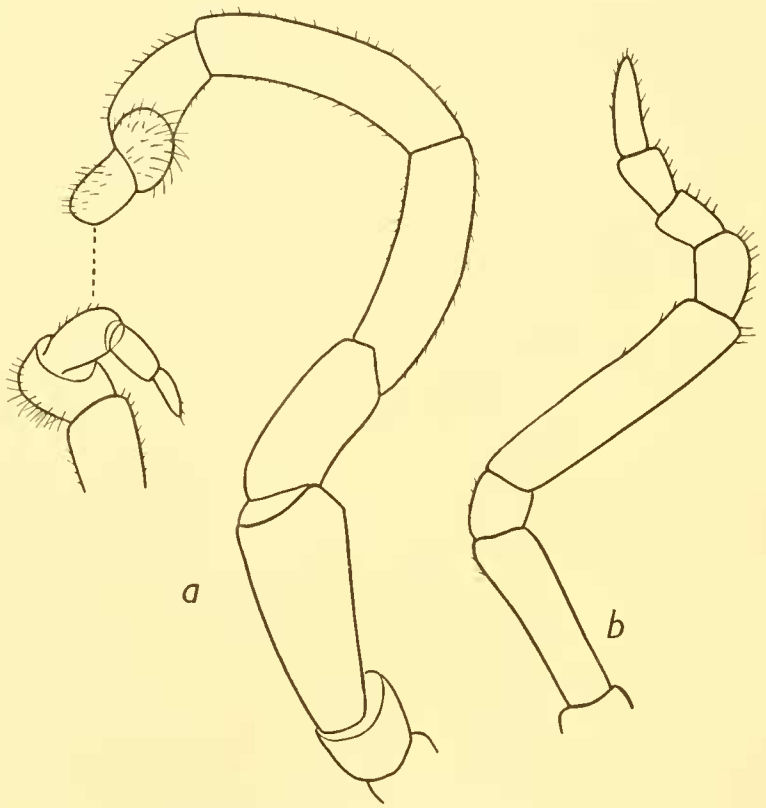

Fig. 49. *Ammothea tetrapora*, n.sp.: *a*. Oviger of male. *b*. Palp. (Both × 20.)

restricted almost entirely to the dorsal surface of the longer segments, with a single row on each lateral and ventral surface. The genital openings are present on the second coxae of *all four* legs.

The *female*, apart from the usual sexual differences, agrees with the male. The femur is only four times as long as wide.

Remarks. The smaller specimens from St. 51 (measuring 6–6·8 mm. in length) all have conspicuous genital openings, but the fingers of the chelae are rather longer than in the holotype and the legs are relatively shorter and stouter. There are four pairs of genital openings in each male specimen; in the other species of *Ammothea* the genital openings are only present on the second coxa of the last two pairs of legs.

This species agrees with *A. longispina*, n.sp., in the number of palpal segments, but

it is a smaller form with a shorter, more cylindrical proboscis, a longer palp and much shorter spines on the propodus (see key).

Measurements (*mm.*)

	♂ (holotype)	♂ (St. 51)	♀ (St. WS 244)
Length of proboscis	4·8	3·6	4·8
Proximal width of proboscis ...	2·0	2·0	2·0
Length of trunk	8·0	6·8	8·0
Length of cephalic segment ...	3·6	3·4	4·0
Width of anterior cephalic lobes ...	2·2	2·43	2·4
Width across second lateral processes	7·47	6·0	6·8
Length of abdomen	2·8	2·0	2·75
Length of scape	2·1	1·8	2·2
Greatest width of scape	1·0	0·9	1·0
Third leg:			
First coxa	1·6	1·47	1·6
Second coxa	3·3	2·5	3·2
Third coxa	0·8	1·0	1·0
Femur	9·4	6·4	9·2
First tibia	9·4	6·4	8·8
Second tibia	10·2	6·8	10·0
Tarsus and propodus	3·2	2·75	3·2
Claw	1·5	1·2	1·33
Auxiliaries	0·6	0·53	0·5

Ammothea longispina, n.sp. (Figs. 50 *b*, 51 and 52).

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 1 ♀ (holotype).

DESCRIPTION OF HOLOTYPE. *Trunk* rather compact; lateral processes separated by narrow intervals, last two pairs by almost their own diameter. Transverse body ridges prominent, each with a narrow, conical median projection. Cephalic segment with a blunt rounded lobe external to the insertion of each chelophore; hardly as long as the sum of the two succeeding segments. Ocular tubercle rather higher than wide, stout, rounded at apex; eyes set near apex, of small size but the anterior rather larger than the posterior pair (Fig. 51).

Proboscis longer than trunk, straight, slender; widest in proximal third narrowing to almost half this width anteriorly; apparently suited for probing.

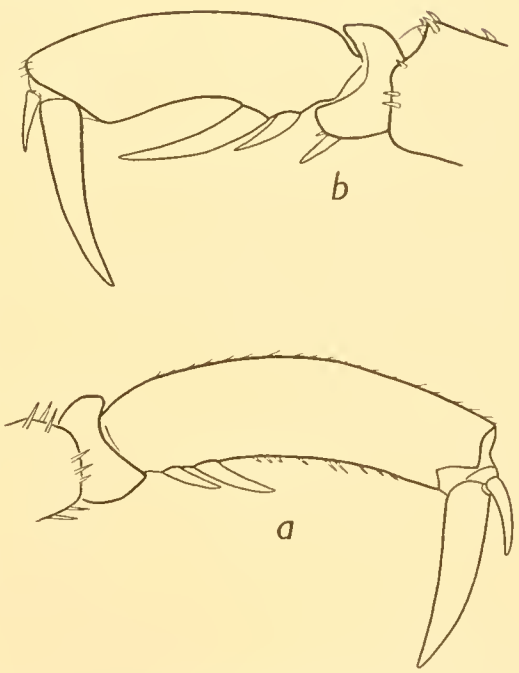

Fig. 50. Terminal segments of third leg of: *a. Ammothea tetrapora*, n.sp. *b. A. longispina*, n.sp. (Both × 20.)

Abdomen rather long but much elevated, so that it does not reach beyond the distal end of the fourth lateral process.

Chelophore almost one-third of proboscis; scape twice as long as wide distally; chela small, fingers almost obsolete.

Palp much shorter than proboscis, with only eight segments; second subequal to fourth segment (Figs. 51 and 52 *a*).

Oviger as represented in Fig. 52 *b*.

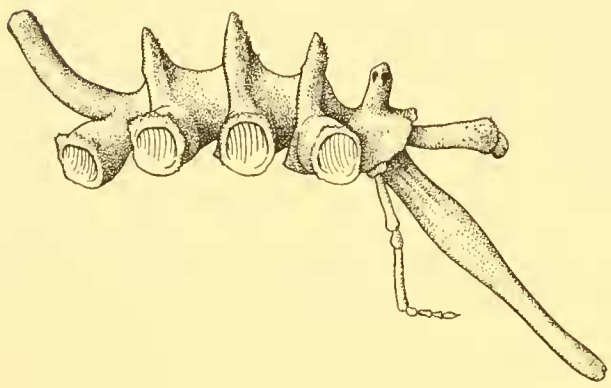

Fig. 51. *Ammothea longispina*, n.sp. Holotype. Lateral view of body with chelophore and palp: × 3.

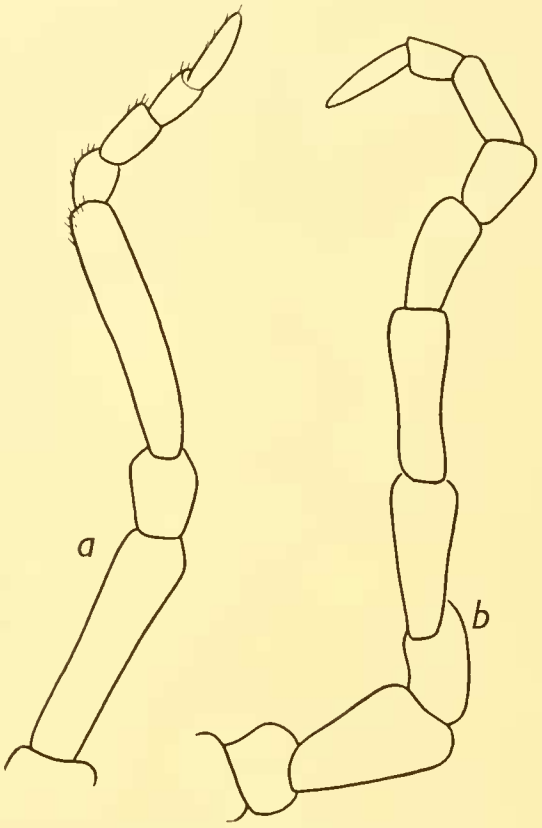

Fig. 52. *Ammothea longispina*, n.sp. Holotype: *a*. Palp: × 15. *b*. Oviger: × 11.

Third leg rather short and stout. Second coxa approximately equal to the sum of the first and third. Femur five times as long as wide, slightly shorter than second tibia. Terminal segments as represented in Fig. 50 *b*; distal spine on propodus unusually large, the smaller spine wanting on the propodus of the first leg.

Setules on trunk restricted to the conical processes of each transverse ridge, the two low cephalic protuberances and the distal border of each lateral process. On the legs they are arranged in longitudinal rows on the longer segments; on the dorsal border of each tibia they are replaced by small, curved spines.

Measurements (*mm.*)

Length of proboscis	13·3
Greatest width of proboscis	2·4
Length of trunk	11·6
Length of cephalic segment	4·9
Width of anterior border of cephalon	3·9
Width across second lateral processes	10·0
Length of abdomen	5·6
Length of chelophore	4·0

Third leg:	
First coxa	2·8
Second coxa	4·6
Third coxa	2·0
Femur	14·0
First tibia	12·2
Second tibia	15·0
Tarsus and propodus ...	4·8
Claw	2·8
Auxiliaries	0·8

Remarks. Each palp seems to be quite perfect and there is no distinct evidence of fusion of any two segments. This species is much larger than *A. tetrapora* and is characterized by (1) the long, tapering proboscis, (2) the relatively short palp (in *A. tetrapora* the palp is longer than the proboscis), (3) the very large spine on the propodus, and (4) the blunt antero-lateral cephalic lobes.

Ammothea spinosa (Hodgson) (Fig. 53).

Leionymphon spinosum, Hodgson, 1907, p. 49, pl. vii, fig. 2.
Ammothea spinosa, Bouvier, 1913, p. 123 (in key).
Ammothea spinosa, Calman, 1915, p. 52.

St. WS 215. 31. v. 28. 47° 37′ S, 60° 50′ W, 219–146 m.; f. gn. S. Commercial otter trawl: 1 ♂.

St. WS 245. 18. vii. 28. 52° 36′ S, 63° 40′ W, 304–290 m.; d. gn. S. Sh. Commercial otter trawl: 1 ovigerous ♂.

Remarks. There can be no doubt that these two specimens belong to *A. spinosa* although they are more compactly built, with much smaller non-recurved "tubercular processes" on each lateral process, than in the holotype. Also the fine, silky hairs on body and legs are very sparse.

One of the most outstanding characteristics of the species, namely the variation in the terminal segments of the walking legs, has not been adequately described by Hodgson (1907, p. 50). In all specimens examined the two anterior pairs of legs each have the propodus relatively short and stout, with numerous spines on the ventral margin arranged in the manner represented in Fig. 53 *a*. The propodus of the third or fourth leg, on the other hand, is relatively slender with 6–7 small spines on the proximal half of the ventral margin and none on the distal half (Fig. 53 *b*). The first tibia is longer than the second. In these two respects *A. spinosa* differs from all the other Antarctic species of the genus.

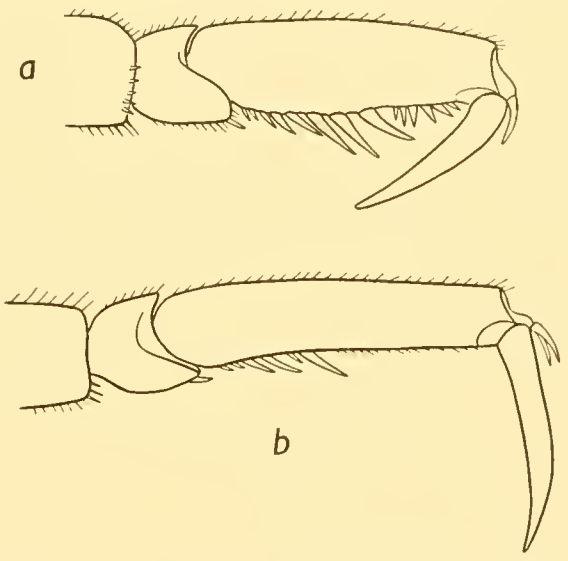

Fig. 53. *Ammothea spinosa* (Hodgson). Holotype: terminal segments of *a*, first leg; *b*, fourth leg: ×15.

Distribution. Ross Sea and Magellan District.

Ammothea minor (Hodgson).

Leionymphon minus, Hodgson, 1907, p. 44, pl. vi, fig. 2.
Ammothea minor, Bouvier, 1913, pp. 123, 131, figs. 83, 84.
Ammothea gracilipes, Bouvier, 1913, p. 132, figs. 85–87.
Ammothea minor, Calman, 1915, p. 52.
Ammothea (*Leonymphon*) *minor*, Loman, 1923, p. 23.

St. 27. 15. iii. 26. West Cumberland Bay, South Georgia; 3·3 miles S 44° E of Jason Light, 110 m.; M. R. Large dredge: 1 ♂.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 1 immature specimen.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point, to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 1 immature specimen.

St. 190. 24. iii. 27. Bismarck Strait, Palmer Archipelago, 64° 56′ S, 65° 35′ W, 93–130 m.; St. M. R. Large dredge: 1 ♀ with a few Foraminifera and Polyzoa on legs.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 1 immature specimen bearing some Polyzoa and Foraminifera.

Remarks. The specimens agree well with Bouvier's description of *A. gracilipes*.

Distribution. This species is recorded from both sides of the Antarctic—the Ross Sea and the region around South Georgia.

Ammothea calmani, n.sp. (Figs. 54 and 55).

A. striata?, Calman, 1915, p. 55.

St. 181. 12. iii. 27. Schollaert Channel, Palmer Archipelago, 64° 20′ S, 63° 01′ W, 160–335 m.; m. St. Large otter trawl: 1 immature specimen with large chelophores.

This immature specimen belongs to the same species as the large male referred, with considerable doubt, to *A. striata* by Calman (1915, p. 55). The adult specimen may be regarded as the holotype.

Description of immature specimen. *Trunk* with second to fourth lateral processes separated by their own diameter. Transverse body ridges prominent but not greatly elevated in the middle line. Cephalic segment equal to the sum of the two succeeding segments. Ocular tubercle a little higher than wide, apex bluntly pointed and on a level with the median transverse ridge. Anterior very much larger than the posterior pair of eyes (Fig. 54).

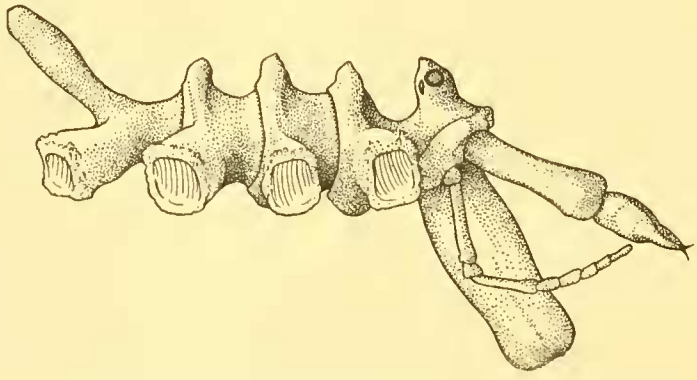

Fig. 54. *Ammothea calmani*, n.sp. Young specimen. Lateral view of body with chelophore and palp: × 5.

Proboscis short, sub-cylindrical; length almost three times the width and approximately equal to the sum of the two anterior segments of trunk.

Abdomen elevated at an angle of about 45°, reaching a little beyond fourth lateral process.

Chelophore slightly longer than proboscis; scape longer than chela and rather slender (length 2·5 times the distal width).

Palp considerably longer than proboscis, with nine segments, of which the second and fourth are subequal (Fig. 55 *a*).

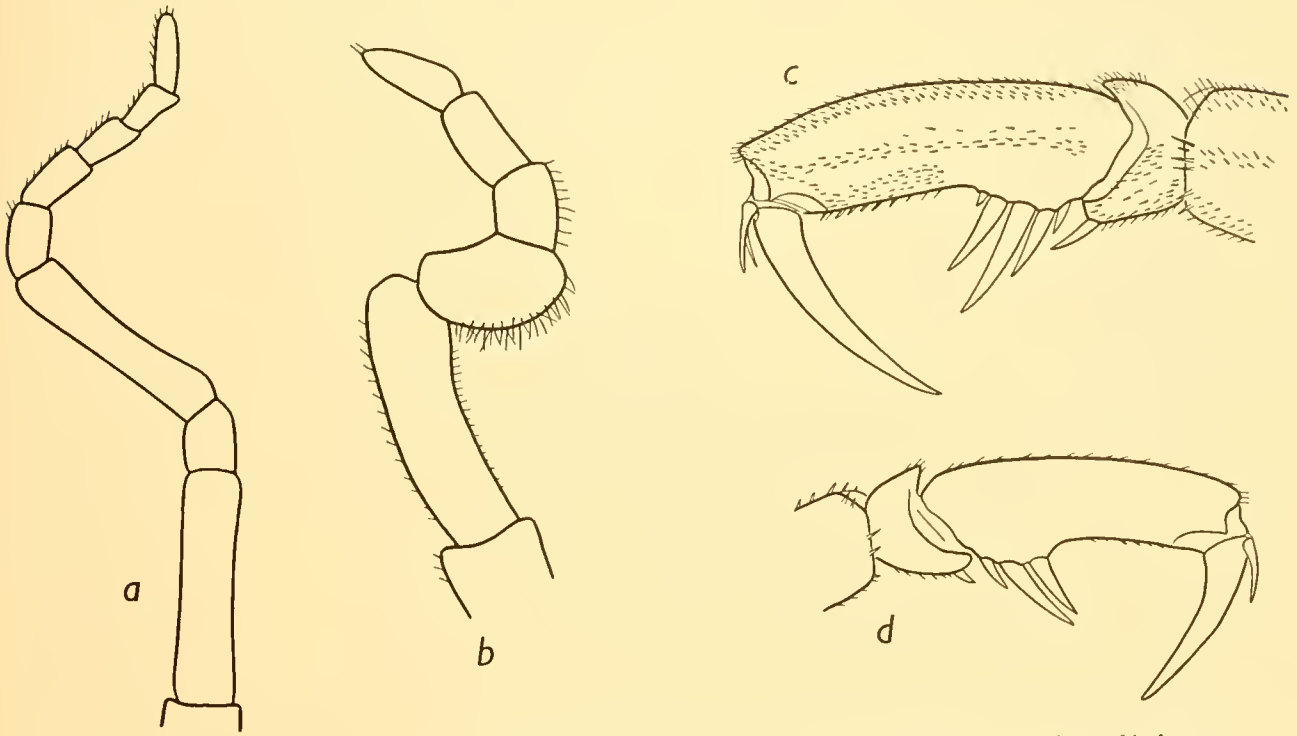

Fig. 55. *Ammothea calmani*, n.sp.: *a*. Palp of young specimen. *b*. Terminal segments of oviger of holotype. *c*. Terminal segments of third leg of holotype. *d*. Same of young specimen. (*a* and *b*: ×15; *c* and *d*: ×10.)

Oviger small but with all ten segments distinct.

Third leg rather slender; femur 5·5 times as long as wide; second tibia the longest segment. Propodus with two large and one small spine on the proximal ventral margin (Fig. 55 *d*); the terminal segments are very similar in all four legs.

Measurements (*mm.*)

Length of proboscis	5·8
Width of proboscis	2·2
Length of trunk	10·5
Length of cephalic segment	4·2
Width of anterior border of cephalon	3·1
Width across second lateral processes	7·9
Length of abdomen	3·6
Length of scape	4·0
Length of chela	3·0

Third leg:	
First coxa	1·8
Second coxa	4·0
Third coxa	1·8
Femur	11·0
First tibia	10·7
Second tibia	12·0
Tarsus and propodus ...	5·0
Claw	2·4
Auxiliaries	0·8

Remarks. The adult male is not in a sufficiently good condition to give accurate measurements. It agrees with the immature specimen in most respects. The transverse body ridges on the second and third segments are more massive and are higher than the ocular tubercle. The chela is greatly reduced so that the chelophore is shorter than the proboscis. A fourth spine is present on the propodus of each walking leg (Fig. 55 *c*) and the setules are arranged in distinct longitudinal bands on the three long segments. Segments 2–6 of the oviger measure 4·4, 3·6, 4·0, 4·4 and 2·5 mm. respectively; the terminal segments are represented in Fig. 55 *b*. The right palp is slightly abnormal near the tip; segments 7 and 8 seem to be fused together.

This species appears to be related to *A. stylirostris*, from which it can easily be distinguished by (1) the shape of the proboscis, (2) the longer claw and much larger spines on the propodus, (3) the larger chelophore, and (4) the much shorter fourth palpal segment.

Distribution. Palmer Archipelago and off Oates Land.

Ammothea stylirostris, n.sp. (Figs. 56 and 57).

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 1 ♀ (holotype) and 1 immature specimen with well-developed chelae.

Description of holotype. *Trunk* of rather compact build; intervals between lateral processes increasing posteriorly. Transverse body ridges rather prominent, each rising

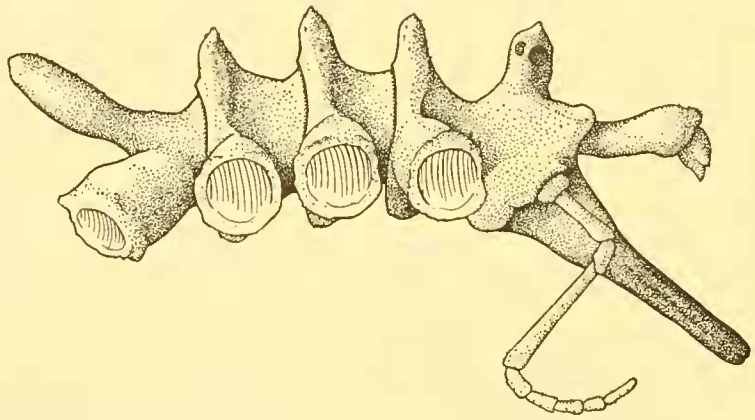

Fig. 56. *Ammothea stylirostris*, n.sp. Holotype. Lateral view of body with chelophore and palp: × 5.

in the centre to a low, rounded point. Cephalic segment nearly as long as the sum of the three posterior segments, considerably expanded on a level with the ocular tubercle; a low rounded lobe projecting over the base of each scape. Ocular tubercle almost half as high again as wide, tapering abruptly to a point distally. Anterior twice as large as the posterior pair of eyes (Fig. 56).

Proboscis approximately two-thirds as long as trunk, straight, widest at base, which is surrounded by a prominent collar, and gradually narrowing distally; presumably adapted for probing.

Abdomen elevated at an angle of about 45° and reaching to distal end of fourth lateral process.

Chelophore short, less than one-third of proboscis; scape short, clubbed; chela small, with fingers reduced to small blunt stumps.

Palp rather longer than proboscis, with nine segments (Fig. 57 *b*); fourth almost twice as long as second segment.

Oviger as represented in Fig. 57 *a*.

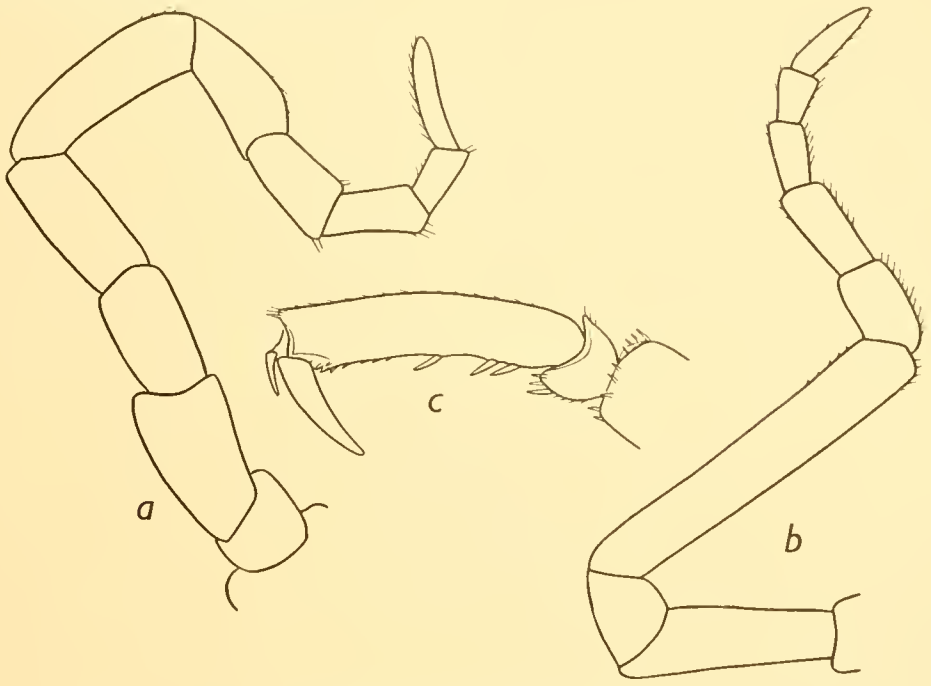

Fig. 57. *Ammothea stylirostris*, n.sp. Holotype: *a*. Oviger: ×15. *b*. Palp: ×15. *c*. Terminal segments of third leg: ×11.

Third leg relatively short and stout. Second coxa equal to the sum of the first and third. Femur almost five times as long as wide; second tibia the longest segment; terminal segments as represented in Fig. 57 *c*. Setules arranged in longitudinal rows on the longer segments.

Measurements (*mm.*)

		Third leg:	
Length of proboscis	7·8	First coxa	2·27
Basal width of proboscis	3·6	Second coxa	4·0
Length of trunk	11·2	Third coxa	1·73
Length of cephalic segment	5·4	Femur	11·2
Greatest width of cephalon	4·6	First tibia	10·6
Width of anterior border of cephalon	3·4	Second tibia	12·8
Width across second lateral processes	8·4	Tarsus and propodus ...	4·6
Length of abdomen	3·6	Claw	1·8
Length of chelophore	2·2	Auxiliaries	0·75

Remarks. The immature specimen measures 8·5 mm. in length (trunk only) and is very soft; the chelophores are half as long as the trunk, with perfect chelae.

The proboscis is rather similar to that of *A. longispina*, n.sp., but is only two-thirds

as long as the trunk; the palp, moreover, has nine instead of eight segments; the spines on the ventral margin of the propodus are much smaller and the claw is much shorter.

The specimen described as *Ammothea*, sp.? (WS 216) is nearly related to this species; but one palp is undergoing regeneration distally and the other does not appear to be quite normal as regards the terminal segments (Fig. 58 *b*). The differences between the two forms are given in the key.

Ammothea, sp.? (Fig. 58).

St. WS 216. 1. vi. 28. 47° 37′ S, 60° 50′ W, 219–133 m.; f. S. Commercial otter trawl: 1 ♀.

The single female specimen bears a strong superficial resemblance to the holotype of *Ammothea longispina* but is of much smaller size. The proboscis is of the same type, although it is not quite as long as the trunk. The right palp has nine segments[1] and the fourth is distinctly longer than the second segment. Unfortunately the left palp has been damaged and the tip is undergoing regeneration; the sixth segment is about to bifurcate and a seventh segment is present on the inner antero-lateral angle. There are

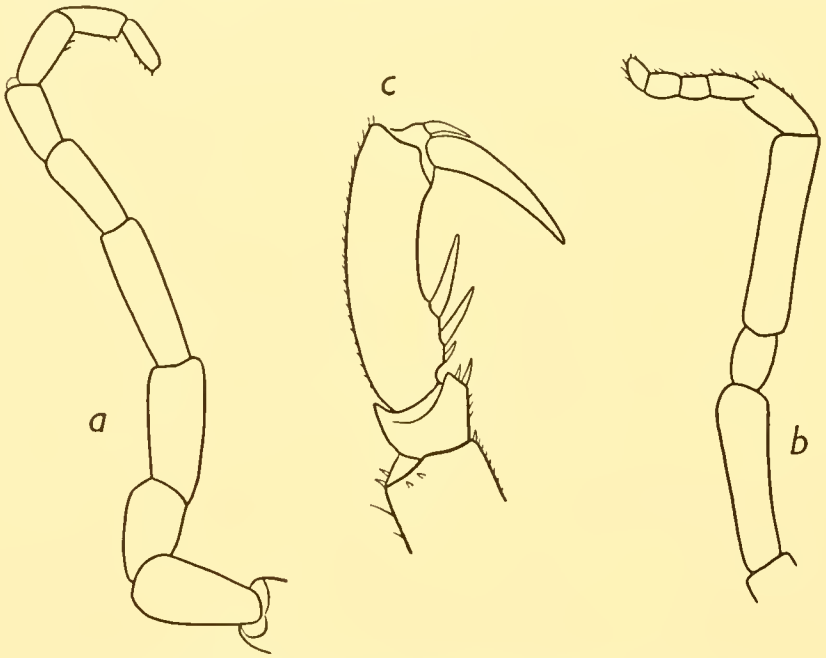

Fig. 58. *Ammothea*, sp.? St. WS 216: *a*. Oviger: ×15. *b*. Right palp: ×15. *c*. Terminal segments of third leg: ×11.

no prominent rounded lobes on the anterior margin of the cephalon and the anterior spine on the propodus is much shorter than in *A. longispina* (Fig. 58 *c*, cf. Fig. 50 *b*). The oviger is represented in Fig. 58 *a*.

The specimen appears to be mature, for the genital apertures are large and conspicuous. If the palp is normally nine-jointed this species would not be the same as *A. stylirostris*. According to Bouvier's key it is nearest to *A. glacialis* (Hodgson), but the proboscis is strikingly different in the two forms.

[1] The terminal segments of this palp also may have been regenerated (see Fig. 58 *b*).

Measurements (mm.)

Length of proboscis	6·8	Third leg:	
Basal width of proboscis	2·0	First coxa	1·4
Length of trunk	7·6	Second coxa	3·2
Length of cephalic segment	3·2	Third coxa	1·2
Width of anterior border of cephalon	2·53	Femur	9·8
Width across second lateral processes	6·4	First tibia	8·2
Length of abdomen	3·07	Second tibia	10·0
Length of chelophore	2·2	Tarsus and propodus ...	3·2
		Claw	1·55
		Auxiliaries	0·6

Ammothea carolinensis, Leach (= *Ammothea grandis*, Pfeffer).

A. carolinensis, Calman, 1915 *a*, pp. 310–314, text-figs. 1–3 (references on p. 314, that of Hodgson, 1907, excepted); 1915, p. 52.
Leionymphon grande, Hodgson, 1908, p. 179.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia, 200 yards from shore, under Mount Duse, 17–27 m.; M. Small beam trawl: 1 immature specimen.

St. 145. 7. i. 27. Stromness Harbour, South Georgia, between Grass Island and Tonsberg Point, 26–35 m. Small beam trawl: 1 ovigerous ♂.

S.S. Carl. 1. iv. 25. Brought up on anchor in Maiviken, South Georgia: 1 specimen, soft, probably a slightly immature ♀.

Sappho Pt. 2. iv. 26. Grytviken, South Georgia, washed up on beach: 1 ♀, overgrown with Polyzoa.

Shore Collection. 25. ii. 26. Cumberland Bay, South Georgia, near Green Point: 1 ♀, overgrown with Polyzoa on proboscis and legs.

DISTRIBUTION. Western Antarctic—South Georgia and farther south.

Ammothea clausi, Pfeffer.

Bouvier, 1913, p. 135, text-figs. 88, 89 (for references and synonymy).
Loman, 1923, p. 23.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia, 200 yards from shore, under Mount Duse, 17–27 m.; M. Small beam trawl: 1 ♀.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ W, 342 m.; R. Large dredge: 2 ♀♀.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: 3 ♀♀ (one with 4 egg capsules (?) attached to proboscis), 2 immature specimens.

WS 25. 17. xii. 26. Undine Harbour (North), South Georgia, 18–27 m.; M. S. Small beam trawl: 2 ♀♀.

WS 62. 19. i. 27. Wilson Harbour, South Georgia, 15–45 m. Small beam trawl: 1 ♀.

MS 62. 24. ii. 26. East Cumberland Bay, ½ cable E to 3¾ cables S of Hobart Rock, 31–40 m. Small beam trawl: 1 ♀.

MS 67. 28. ii. 26. East Cumberland Bay, 3 cables NE of Hobart Rock to ½ cable W of Hope Point, 38 m. Small beam trawl: 1 immature specimen.

MS 68. 2. iii. 26. East Cumberland Bay, 1·7 miles S ½ E to 8½ cables SE ½ E of Sappho Point, 220–247 m. Large rectangular net: 2 ♀♀, 1 ♂.

Shore Collection. 2. iv. 26. South Georgia, Grytviken, Sappho Point, 1 ♀, washed up on shore.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 1 specimen.

Remarks. It is possible that *Ammothea australis* may prove to be only an eastern form of *A. clausi*. At any rate the differences between the two are very slight.

Genus Achelia, Hodge

Hodge, 1864, p. 114.
Bouvier, 1913, p. 122 (in key), pp. 138–140.
Calman, 1915, p. 56.
Loman, 1923, p. 24.

This genus differs from *Ammothea* in (1) the much smaller size of the species, (2) the absence of transverse body ridges, and (3) in the type of the male oviger (cf. Figs. 49 *a*, 55 *b* and 59 *a* and *b*). The tubercles that bear the male genital openings and the openings of the femoral cement glands are not always very prominent (e.g. in *A. hoekii*, Fig. 60 *a*).

Achelia hoekii (Pfeffer)

(Figs. 59 *a*, *b* and 60 *a*, *c*).

Ammothea Hoekii, Pfeffer, 1889, *Jahrb. Hamburg. Wiss. Anst.*, VI, Heft 2, p. 46.
? *Ammothea* (*Achelia*) *Hoekii*, Loman, 1923, p. 24.

St. 174. 28. ii.–1. iii. 27. Deception Island, South Shetlands, outside entrance, W of Light, 5–10 m. Large fish trap: 2 ♀♀, 1 ♂.

Description. *Trunk* compact, lateral processes in contact; sutures between the segments distinct in two specimens—the last suture is rather faint in one female. Cephalic segment subequal to the sum of the three posterior segments; cephalon broad; ocular tubercle wider than high, bluntly rounded distally.

Proboscis equal to trunk, widest in the middle and bluntly conical both proximally and distally.

Abdomen rather short, reaching to distal end of first coxa.

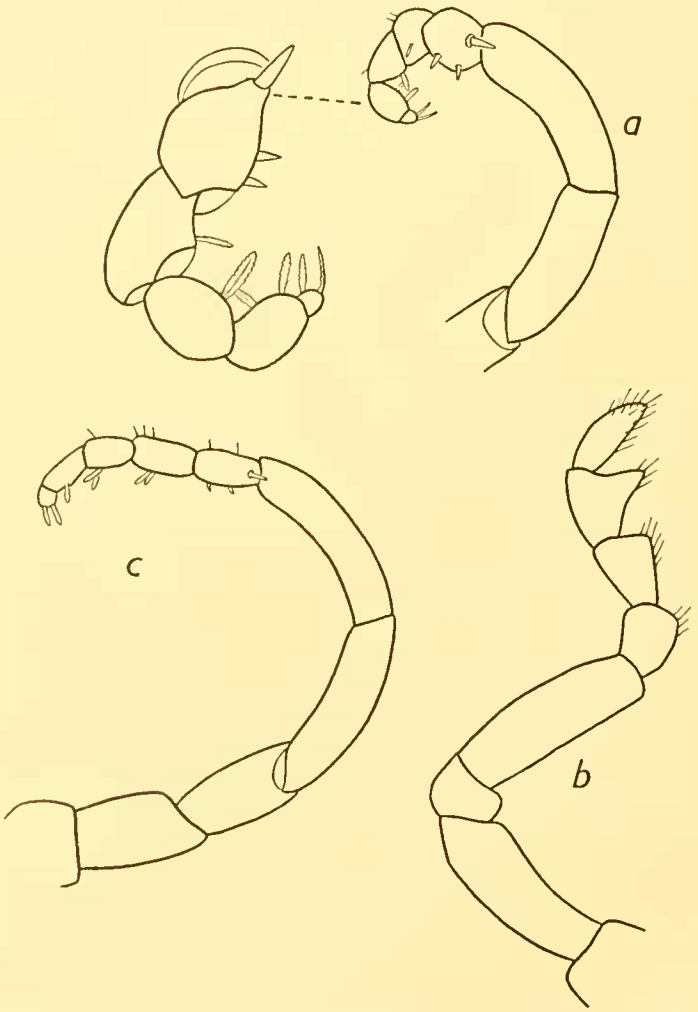

Fig. 59. *Achelia hoekii* (Pfeffer): *a*. Segments 4–10 of male oviger: × 47 and terminal segments still further enlarged. *b*. Palp of male: × 60. *A. communis*, Bouvier. *c*. Oviger of male: × 60.

Chelophore scarcely half of proboscis; scape twice as long as the greatly reduced chela.

Palp with the terminal segments distinctly serratiform ventrally in the male (Fig. 59 *b*), rather less so in the female; segments 2 and 4 subequal.

Oviger in the male relatively more robust than that of *Achelia communis*, with the terminal segments much more twisted (cf. Fig. 59 *a* and *c*). The prominent spine near the proximal articulation of segment 6 is very characteristic (Fig. 59 *a*).

Third leg of male as represented in Fig. 60 *a*; the male genital opening is situated on a much lower tubercle than in *A. communis* and there is no prominent cement gland-tubercle at the distal end of the femur (cf. Fig. 60 *a* with Bouvier, 1906, p. 48, fig. 32).

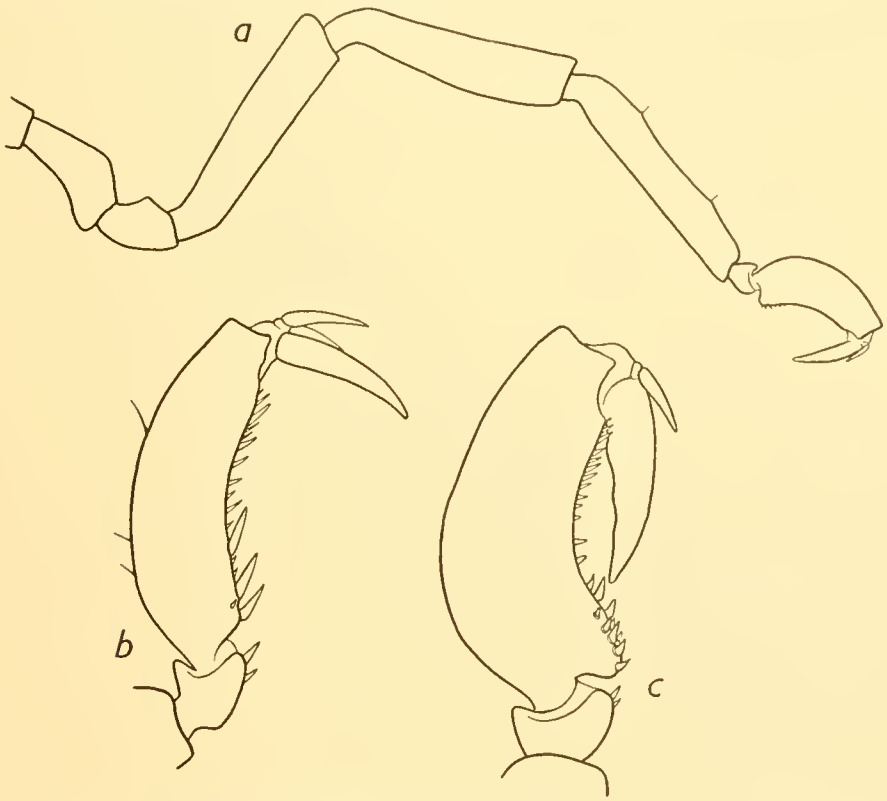

Fig. 60. *Achelia hoekii* (Pfeffer): *a*. Third leg of male: × 20. *c*. Terminal segments of third leg: × 53.
A. communis Bouvier: *b*. Terminal segments of third leg: × 60.

The propodus is higher and more arched, with a distinct heel beset with a number of short stout spines (cf. Fig. 60 *b* and *c*). There are no prominent conical tubercles on the first coxae in the female, and just a hint of them in the male.

Remarks. The co-types of *Achelia hoekii* were examined in the Zoological Museum, Hamburg. The Discovery specimens agree in all respects with sketches made of a male and of a female co-type. Loman (1923, p. 24) states that *A. communis*, Bouvier, is co-specific with *A. hoekii*. Specimens of the former, presented by Professor Bouvier to the British Museum, differ in several respects from the types of *A. hoekii*. The differences (described and figured above) in (1) oviger, (2) walking legs, seem to justify

the separation of *A. communis* from *A. hoekii*. In the latter the palp is more serrated distally and the antero-lateral processes on the cephalon are absent.

DISTRIBUTION. South Georgia and South Shetlands.

Achelia intermedia, Calman (Fig. 61).

Calman, 1915, p. 60, fig. 15 A–C.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 6 ♀♀, 1 ♂, with *A. brucei*.

? St. WS 27. 19. xii. 26. 53° 55′ S, 38° 01′ W, 107 m. 1 m. horizontal tow-net—net touched bottom: 1 ♀.

REMARKS. The specimens from St. 371 agree in most respects with the Terra Nova specimens of *Achelia intermedia*. The walking legs, however, are relatively longer and more slender (see Fig. 61 *a* and *b*, and the ratios given below).

	Terra Nova		Discovery	
	♂	♀	♂	♀
Femur: length ÷ maximum width	4·5	3·3	5·75	4·75
First tibia: length ÷ maximum width	5·0	4·75	6·25	7·0
Second tibia: length ÷ maximum width	6·83	6·66	8·89	9·5

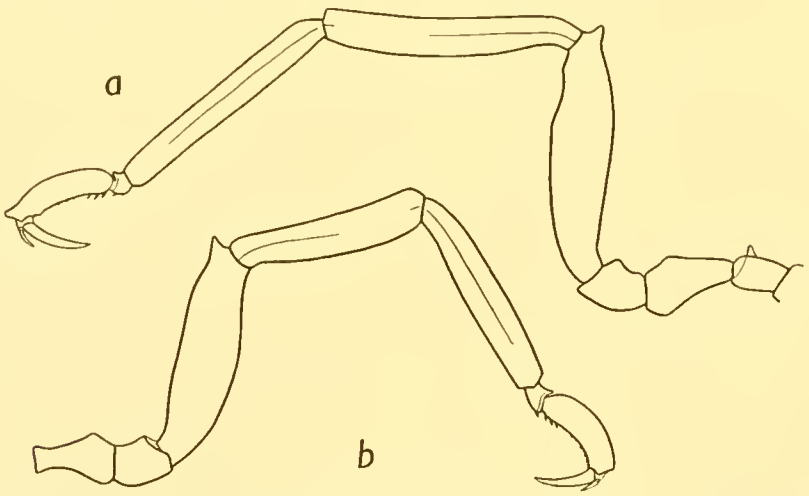

Fig. 61. *Achelia intermedia*, Calman: *a*. Third leg of female—Discovery collection. *b*. Same—Terra Nova collection. (Both ×13.)

The specimen from WS 27 is rather different from all the others. The chelophore is longer, exceeding the second palpal segment, but is not quite half of the proboscis—in this respect the specimen approaches *Achelia spicata*, Hodgson (Calman, 1915, p. 57). On the other hand the main claw is relatively shorter and only twice as long as the auxiliaries—in this respect the specimen approaches *Achelia brucei*. The ocular tubercle, however, is longer than wide, terminating in a long acute point. This specimen is another aberrant or "abnormal" form, agreeing with the species in group *a* of Calman's key in most respects, but approaching those in group *b* as regards the auxiliary claws of the walking legs (Calman, 1915, p. 57).

DISTRIBUTION. Previously recorded from off Cape Adare.

Achelia brucei, Calman.

Calman, 1915, p. 61, fig. 16 A–C.

St. 141. 29. xii. 26. East Cumberland Bay, South Georgia, 200 yards from shore, under Mount Duse, 17–27 m.; M. Small beam trawl: 1 ♀.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 4 ♀♀ with *A. intermedia*.

DISTRIBUTION. Previously recorded from off Cape Adare.

Achelia serratipalpis, Bouvier.

Bouvier, 1913, p. 140, figs. 90–95.
Loman, 1923, p. 25.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: 2 ♀♀, 5 ♂♂ (3 ovigerous), with *Nymphon charcoti*.

? St. 274. 4. viii. 27. Off St Paul de Loanda, Angola, from 8° 40′ 15″ S, 13° 13′ 45″ E to 8° 38′ 15″ S, 13° 13′ E, 64–65 m.; gy. M. Large otter trawl: 1 incomplete ♀.

DISTRIBUTION. The incomplete female specimen from St. 274 undoubtedly belongs to this well-defined species, which has been recorded only from Antarctic waters. There appears to be little but the exoskeleton in this instance and it is probable that the specimen was captured in the Antarctic but may have been left entangled in the net for some time. At any rate, the material is not sufficient to warrant the supposition that *A. serratipalpis* extends from Graham Land, the South Shetlands and South Georgia northwards into tropical waters.

Achelia parvula, Loman (Fig. 62).

Loman, 1923 *a*, p. 2, fig. A.

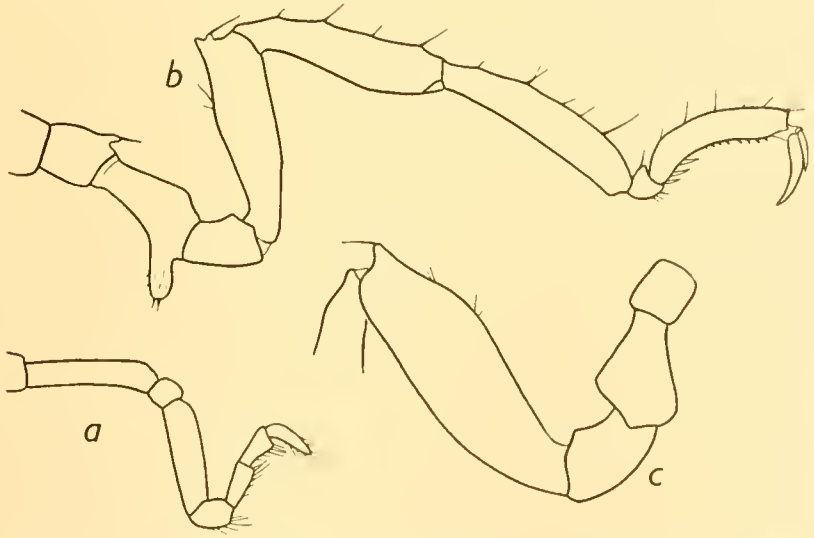

Fig. 62. *Achelia parvula*, Loman: *a*. Palp: × 60. *b*. Third leg of male: × 47. *c*. Proximal segments of third leg of female: × 47.

St. 53. 12. v. 26. Port Stanley, East Falkland Islands, hulk of "Great Britain", 0–2 m. Mussel rake: (1) numerous specimens[1], "sorted from washings from Hydroids and *Mytilus* clumps". (*b*) 2 specimens, "from washings from Kelp root".

St. 58. 19. v. 26. Port Stanley, East Falkland Islands, 1–2 m. Mussel rake: 4 specimens.

Remarks. These specimens agree well with Loman's description of *A. parvula*. As Loman's figures are rather poor the palp and third leg are represented again (Fig. 62).

Distribution. Previously recorded from Possession Bay, East Magellan Strait.

Genus Austroraptus, Hodgson

Hodgson, 1907, p. 54.
Calman, 1915, p. 62.

Each of the three known species of this genus is represented in the present collection. They may be distinguished from each other as follows:

I. Palp six-jointed in adult.
  A. Chela imperfect in adult; scape at least twice as long as wide, without dorsal tubercles; antero-lateral tubercles on cephalon obsolete ..... *A. polaris*, Hodgson
  B. Chela perfect in adult; scape not more than half as long again as wide, with 1–2 dorsal tubercles; antero-lateral tubercles on cephalon present ..... *A. praecox*, Calman

II. Palp eight-jointed [chela imperfect in adult] ..... *A. juvenilis*, Calman

Austroraptus polaris, Hodgson.

Hodgson, 1907, p. 54, pl. viii, fig. 2.
Calman, 1915, p. 62, fig. 17 A–C.
Loman, 1923, p. 30.

St. 170. 23. ii. 27. Off Cape Bowles, Clarence Island, 61° 25′ 30″ S, 53° 46′ 00″ W, 342 m.; R. Large dredge: 1 ♂.

Distribution. This species has been recorded from the eastern and the western side of the Antarctic Zone.

Austroraptus praecox, Calman.

Calman, 1915, p. 65, fig. 19 A–E.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 2 ♂♂.

Distribution. Cape Adare and South Georgia.

Austroraptus juvenilis, Calman.

Calman, 1915, p. 63, fig. 18 A–E.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 1 ♀.

[1] None of the males are carrying ova or larvae.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, 155–178 m.; gn. M. S. Large otter trawl: 2 ♂♂, with *A. praecox*.

St. 195. 30. iii. 27. Admiralty Bay, King George Island, South Shetlands, 62° 07′ 00″ S, 58° 28′ 30″ W, 391 m.; M. St. Medium otter trawl: 1 ♀, 1 ♂, with *Nymphon charcoti*.

St. 363. 26. ii. 30. 2·5 miles S 80° E of SE point of Zavodovski Island, South Sandwich Islands, 329–278 m.; Sc. Large dredge: 1 ♂, bearing ? egg capsules or encysted Protozoa.

St. 371. 14. iii. 30. 1 mile E of Montagu Island, South Sandwich Islands, 99–161 m. Large otter trawl: 1 ♂.

Remarks. In the male from St. 363 large numbers of minute oval bodies are adhering to the appendages. These may be egg capsules or encysted Protozoa; they are found, in smaller numbers, attached to other Pycnogonida, e.g. *Tanystylum pfefferi* (Fig. 68 *b*).

Distribution. Previously recorded from off Cape Adare.

Genus Austrodecus, Hodgson

Austrodecus glaciale, Hodgson (Figs. 63 and 64).

Hodgson, 1907, p. 53, pl. viii, fig. 1.
Bouvier, 1913, p. 147, figs. 96 and 97.
Calman, 1915, p. 66, fig. 20.
Loman, 1923, p. 31.

St. 27. 15. iii. 26. West Cumberland Bay, South Georgia, 3·3 miles S 44° E of Jason Light, 110 m.; M. R. Large dredge: 7 ♀♀, 15 ♂♂.

St. 39. 25. iii. 26. East Cumberland Bay, South Georgia, from 8 cables S 81° W of Merton Rock to 1·3 miles N 7° E of Macmahon Rock, 179–235 m.; gy. M. Large otter trawl: 1 ♀.

St. 42. 1. iv. 26. Off mouth of Cumberland Bay, South Georgia, from 6·3 miles N 89° E of Jason Light to 4 miles N 39° E of Jason Light, 120–204 m.; M. Large otter trawl: 2 ♂♂, 1 ♀.

St. 53. 12. v. 26. Port Stanley, East Falkland Islands, hulk of 'Great Britain', 0–2 m. Mussel rake: 2 ♀♀, 1 ♂.

St. 123. 15. xii. 26. Off mouth of Cumberland Bay, South Georgia, from 4·1 miles N 54° E of Larsen Point to 1·2 miles S 62° W of Merton Rock, 230–250 m.; gy. M. Large otter trawl: 3 ♂♂, 8 adult and immature ♀♀.

St. 144. 5. i. 27. Off mouth of Stromness Harbour, South Georgia, from 54° 04′ S, 36° 27′ W to 53° 58′ S, 36° 26′ W, 155–178 m.; gn. M. S. Large otter trawl: 1 ♂, 2 ♀♀ and 2 immature specimens.

St. WS 33. 21. xii. 26. 54° 59′ S, 35° 24′ W, 130 m.; gy. M. St. 1 m. horizontal tow-net—net touched bottom: 3 immature specimens.

St. WS 228. 30. vi. 28. 50° 50′ S, 56° 58′ W, 229–236 m.; Sh. c. w. S. Commercial otter trawl: 3 ♂♂, 3 ♀♀.

South Georgia:

St. MS 14. 17. ii. 25. From 1·5 miles SE × S to 1·5 miles S ½ W of Sappho Point, East Cumberland Bay, 190–110 m. Small dredge: 1 ♂.

St. MS 65. 28. ii. 26. East Cumberland Bay, 1·6 miles SE of Hobart Rock to 1 cable N of Dartmouth Point, 39 m. Small beam trawl: 1 immature specimen.

St. MS 66. 28. ii. 26. East Cumberland Bay, 2¼ miles SE of King Edward Point Light to 1½ cables W × N of Macmahon Rock, 18 m. Small beam trawl: 2 immature specimens.

St. MS 71. 9. iii. 26. East Cumberland Bay, 9¼ cables E × S to 1·2 miles E × S of Sappho Point, 110–60 m. Small beam trawl: 1 ♂, 6 ♀♀ and immature specimens.

St. MS 74. 17. iii. 26. East Cumberland Bay, 1 cable SE × E of Hope Point to 3·1 miles SW of Merton Rock, 22–40 m. Small beam trawl: 3 ♂♂, 1 ♀.

Remarks. Only one species of this very distinctive genus is known. The holotype of *A. glaciale*, a female from the Ross Sea area, has four bluntly conical tubercles on the mid-dorsal surface of the body and a pair of more acutely conical projections on the first coxa of each leg, the first excepted as the anterior one is absent.

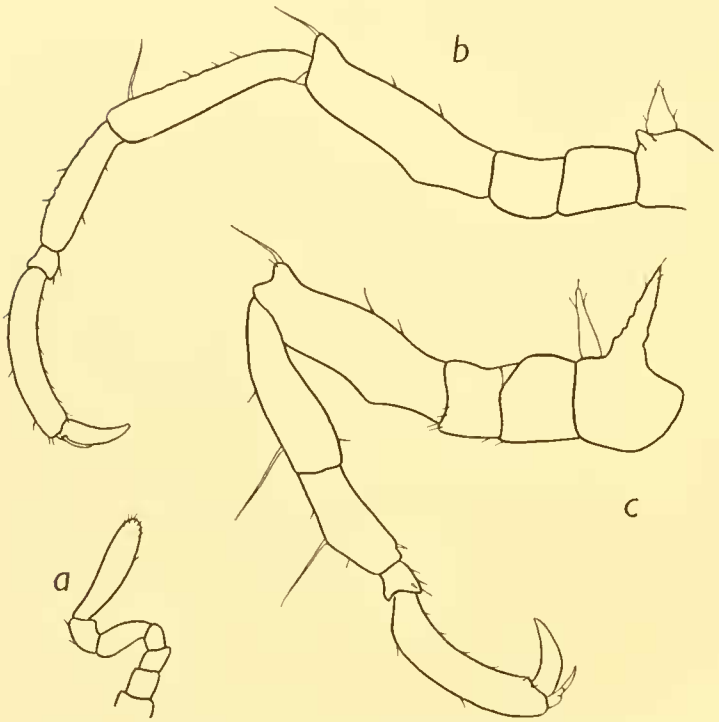

Fig. 63. *Austrodecus glaciale*, Hodgson. Male: *a*. Palp: ×100. *b*. Third leg—St. WS 228: ×60. *c*. Same—St. 53: ×100 (Group I)

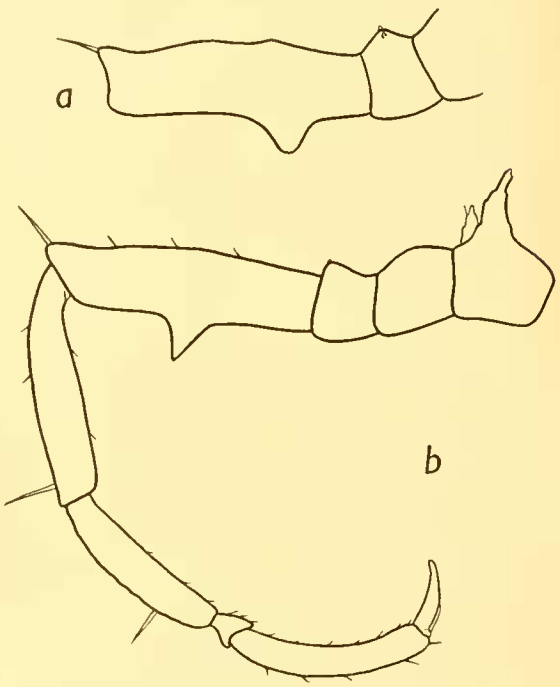

Fig. 64. *Austrodecus glaciale*, Hodgson. Male: *a*. Femur of third leg—Terra Nova collection (GroupI). *b*. Third leg—St. 27 (Group II): ×60.

The numerous specimens in the Discovery collection fall into two groups. In the first group, which is represented by a relatively small proportion of individuals, there are either low conical, or high slender spinose projections on the mid-dorsal surface. Those specimens with high spinose projections have a similar arrangement of the coxal processes as in the holotype. Those specimens with lower, more robust, conical projections on the trunk have the coxal projections arranged as follows: a posterior one on the first coxa of each of the two anterior pairs of legs and an anterior one on the first coxa of each of the two posterior pairs of legs (in addition there is sometimes a very small posterior projection on the coxa of each third leg).

The second group, which includes the bulk of the material, is characterized by (1) the complete absence of any tubercles or processes on the dorsal surface of the trunk in

adults and young, and (2) the presence of an anterior and a posterior conical projection on the first coxa of each walking leg. Also, in the males, the femoral cement-gland opens at the apex of a high, conical projection, whereas, in the first group, it is situated on a low blunt eminence.

The specimens in the Terra Nova collection (Calman, 1915, p. 66), also from the Ross Sea, agree very closely with the holotype; in the male the femoral tubercle is high, but more blunt and situated more proximally than is the acutely conical tubercle in the males of our second group (cf. Fig. 64 *a* and *b*).

It is doubtful if these forms all belong to one variable species; the walking legs show considerable differences (Figs. 63 and 64). The main differences described above may be represented briefly as follows:

Group I. Projections on mid-dorsal surface of trunk present; no anterior projection on first coxa of first leg.

A. Projections on trunk low, rather robust, conical tubercles.

1. Two projections on first coxa of legs 2–4; femoral gland in male opens at the apex of a high, wide, blunt cone (Fig. 64 *a*)
Holotype and Terra Nova specimens

2. One projection on first coxa of all the legs [a small posterior one may also be present on the third leg]; femoral gland in male opens at apex of a very low, blunt eminence (Fig. 63 *b*).....Discovery, St. WS 228

B. Projections on trunk high, slender, spinose; two high projections on first coxa of legs 2–4; femoral gland in male opens at apex of a low, blunt, rounded eminence (Fig. 64 *c*) .....Discovery, St. 53, St. WS 33

Group II. Projections on mid-dorsal surface of trunk absent; anterior and posterior projections on the first coxa of each leg; femoral gland in male opens at apex of a high, narrow cone (Fig. 64 *b*) .....Discovery—all the remaining stations

The material described by Bouvier (1913, p. 147), to judge from the arrangement of the coxal processes, is similar to that from WS 228. The low femoral tubercles in the male would be much more easily overlooked than the high conical ones, which are very striking even in immature specimens (see Calman, 1915, p. 67).

The males, in many cases, appear to be quite adult, although the genital openings have not been observed with certainty; in several instances there seemed to be a small opening on the second coxa of the last leg.

Distribution. Probably circumpolar; recorded from the Ross Sea area, Graham Land region, South Georgia and the Magellan district.

Genus Tanystylum, Miers

A number of previous workers (e.g. Norman and Loman) regard the genus *Clotenia*, Dohrn, as a synonym of *Tanystylum*, Miers. Bouvier (1913, p. 45) retains *Clotenia*, at least provisionally, as distinct from *Tanystylum*, the former having only four, instead of six or seven segments in the palp. Bouvier, however, includes *T. hoekianum*, Schimk., in the genus *Clotenia*, although the palp is described and figured with six segments.

Bouvier lists seven[1] species of *Tanystylum*, and two[2] other species have since been described, namely *T. oedinotum*, Loman (1923, p. 29), and *T. ornatum*, Flynn (1928, p. 33). Several species are imperfectly known or known from a single specimen only (e.g. *T. hoekianum*, Schimk., *T. chierchiae*, Schimk., *T. calcirostre*, Schimk., and *T. oedinotum*, Loman). Therefore it has not been thought advisable to give a key to the determination of species not found in Antarctic and sub-Antarctic waters. The forms with a four-jointed palp are not represented in the Discovery collection, so that the question of the validity or non-validity of the genus *Clotenia*, Dohrn, cannot be discussed here.

Two Antarctic species, *T. styligerum*, Miers, and *T. pfefferi*, Bouvier, have recently been described elsewhere (Gordon, 1932 *a*, p. 87).

Key to the determination of the Antarctic and sub-Antarctic species:

Palp with seven segments:

Long setose spines on walking legs; palpal segments 2 and 4 subequal, long; abdomen long, extending beyond the second coxa of the last leg.....*T. styligerum*, Miers

No long setose spines on walking leg; palpal segment 2 longer than 4; abdomen extending to distal end of first coxa [a low, wide tubercle on dorsal surface of body, between ocular tubercle and abdomen] .....*T. oedinotum*, Loman

Palp with six segments, or with seventh segment more or less fused with sixth.

Walking leg rather slender, second tibia nearly twice the sum of tarsus and propodus (1·75–1·9 : 1) .....*T. pfefferi* (typical form)

Walking leg relatively shorter and more robust; second tibia only about 1·25 times the sum of tarsus and propodus .....*T. pfefferi* (Falkland I. var.)

Tanystylum styligerum, Miers (Fig. 65 *b*).

Nymphon styligerum, Miers, 1875, p. 76.
Tanystylum styligerum, Miers, 1879, p. 213, pl. xi, figs. 9–9 *d*.
Tanystylum kentrodes, Loman, 1923, p. 28, fig. E, 1–4.
Tanystylum longicaudatum, Hodgson, 1907 *a*, p. 13, figs. 4–6.
Tanystylum styligerum, Gordon, 1932 *a*, p. 88.

St. 53. 12. v. 26. Port Stanley, East Falkland Islands, hulk of 'Great Britain', 0–2 m. Mussel rake: 14 specimens, adults and young, "sorted from washings from Hydroids and *Mytilus* clumps" (with *Achelia parvula* and *Austrodecus glaciale*).

Remarks. The specimens agree well with the co-types of *T. styligerum* (Gordon, 1932 *a*, p. 88). Several specimens resemble *T. kentrodes* (Loman, 1923, p. 28) in having a single long spine on the tubercle borne by each of the three anterior lateral processes. In other specimens there are 1–3 spines on each tubercle. The anterior border of the cephalon, measured to the outer rim of the sockets for the palps, is a little less (♂) or a little more (♀) than half the width across the second lateral processes.

The ocular tubercle is more slender and is set further forward than that represented

[1] Excluding *T. hoekianum*, Schimk.; *T. longicaudatum*, Hodgson, however, appears to be a synonym of *T. styligerum*, Miers.

[2] *T. kentrodes* (Loman, 1923, p. 28) is also a synonym of *T. styligerum*.

in Loman's figure (1923, p. 28, fig. E, 1). The fourth palpal segment is not curved and is subequal to the second. The second may be a little shorter than the first tibia. The male oviger is represented in Fig. 65 *b*; the specimens are apparently not quite adult,

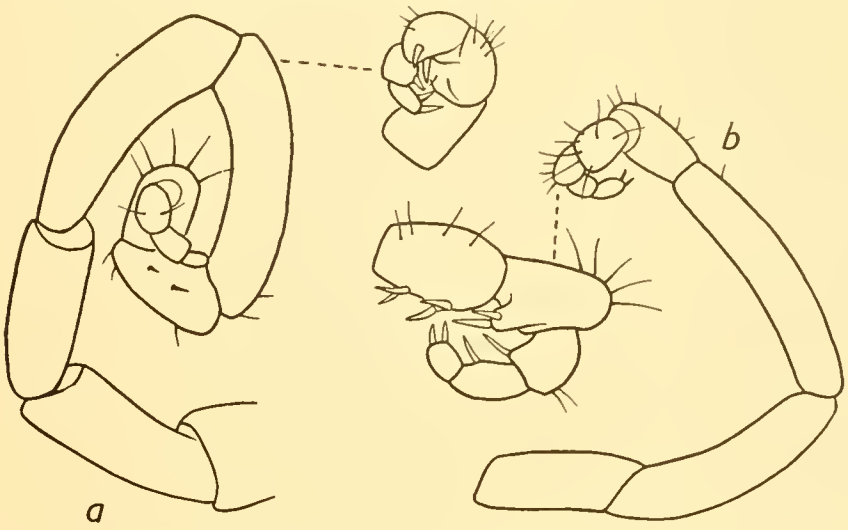

Fig. 65. *Tanystylum pfefferi*, Bouvier: *a*. Male oviger—specimen not quite adult: × 100.
T. styligerum, Miers: *b*. Male oviger—St. 53: × 60 and 100.

as the genital pores are not yet present. The walking leg is considerably more slender than in the female.

Distribution. Kerguelen, the Falkland Islands and Beagle Channel near Tierra del Fuego.

Tanystylum pfefferi, Bouvier (Figs. 65 *a*, 66, 67 and 68).

Clotenia dohrnii, Pfeffer, 1889, p. 48.
Tanystylum pfefferi, Bouvier, 1913, pp. 5, 45 and 122.
Tanystylum pfefferi, Gordon, 1932, p. 90.

(*a*) Typical forms from:

St. WS 25. 17. xii. 26. Undine Harbour (North), South Georgia, 18–27 m.; M. S. Small beam trawl: 1 larvigerous ♂.

St. 456. 18. x. 30. 1 mile E of Bouvet Island, 40–45 m. Large dredge: 1 ♀, 1 larvigerous ♂, with *Nymphon australe*.

(*b*) Smaller forms from:

St. 51. 4. v. 26. Off Eddystone Rock, East Falkland Island, from 7 miles N 50° E to 7·6 miles N 63° E of Eddystone Rock, 105–115 m.; f. S. Large otter trawl: 1 ♂, 1 ♀.

St. 53. 12. v. 26. Port Stanley, East Falkland Island, hulk of 'Great Britain', 0–2 m. Mussel rake: many specimens, ♂♂, ♀♀ and young, "sorted from washings from Hydroids and *Mytilus* clumps"; one ♀ "from washings from Kelp root".

St. WS 124. 9. vi. 27. Gough Island, Penguin Island anchorage, 40° 16′ S, 9° 58′ W, 40–60 m. Large dredge: 1 ♀, 1 ovigerous ♂.

St. 4. 30. i. 25. Tristan da Cunha, 36° 55′ S, 12° 12′ W, 40–46 m.; St. Large dredge: 1 specimen from debris of stones with encrustations.

Remarks. The specimens from WS 25 and St. 456 agree very closely with the female specimen from the Hamburg Museum collection described elsewhere (Gordon, 1932 *a*, p. 90). The almost vertical abdomen, the very short chelophores, the low, wide ocular tubercle and the relative proportions of the palpal segments are characteristic of the species.

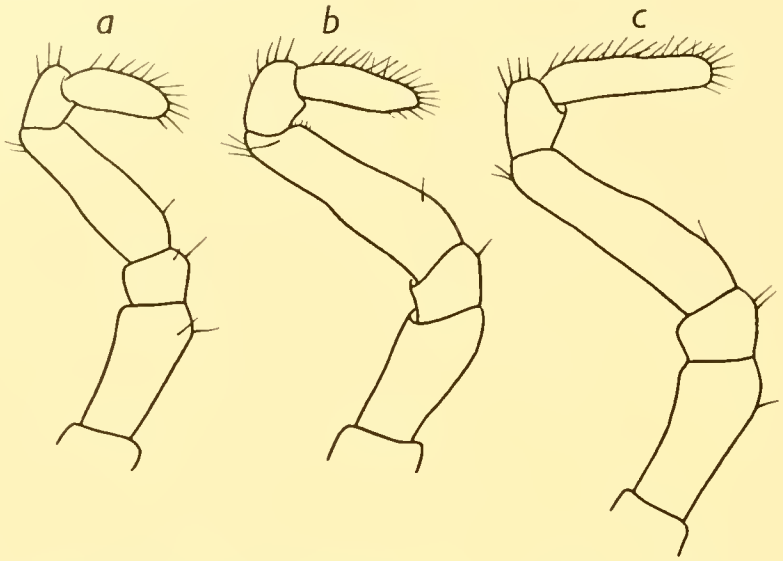

Fig. 66. *Tanystylum pfefferi*, Bouvier. Palp: *a*. St. 53, Falkland Islands: × 100. *b*. St. WS 124, Gough Island: × 80. *c*. St. 456, Bouvet Island: × 60.

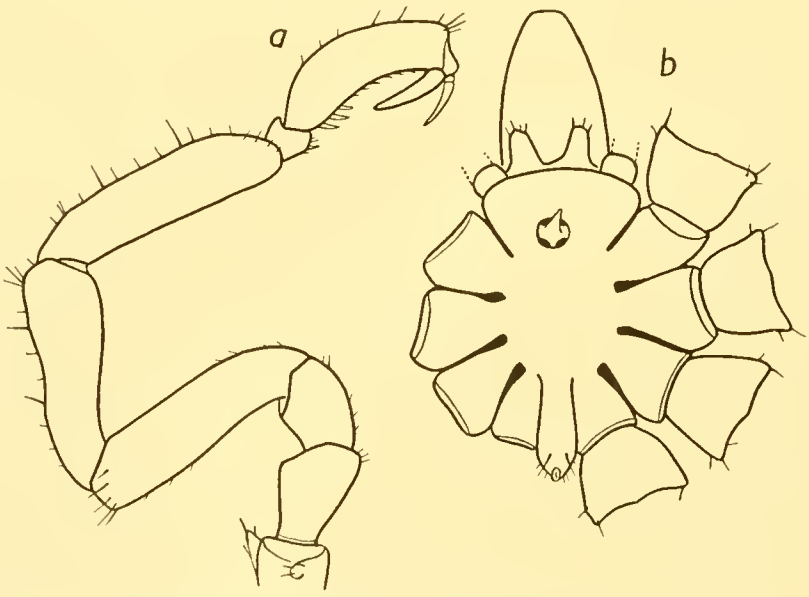

Fig. 67. *Tanystylum pfefferi*, Bouvier. Male—St. 53: *a*. Third leg. *b*. Dorsal view of body with chelophores and first coxae: × 47.

There is a distinct tendency for papal segments 6 and 7 to unite; sometimes a suture appears to be present, but when the palp is cleared and mounted on a slide, no actual suture can be detected. Sometimes there is a distinct median emargination on one side

separating the setae into two groups (Gordon, 1932 *a*, p. 92, fig. 4*c*). Occasionally no emargination occurs and the lateral setae are uniformly arranged, so that all trace of fusion is obliterated and the palp has the appearance of a normal six-jointed appendage (Fig. 66 *c*).

The egg masses are irregularly-shaped rings strung on each oviger like beads on a thread; they number 1–4 on each oviger (the male oviger is represented in Fig. 65 *a*). There are three pairs of male genital openings.

The specimens from the Falkland Islands differ considerably from typical *T. pfefferi*. (1) The palp is six-jointed (without any trace of a seventh segment) and the terminal

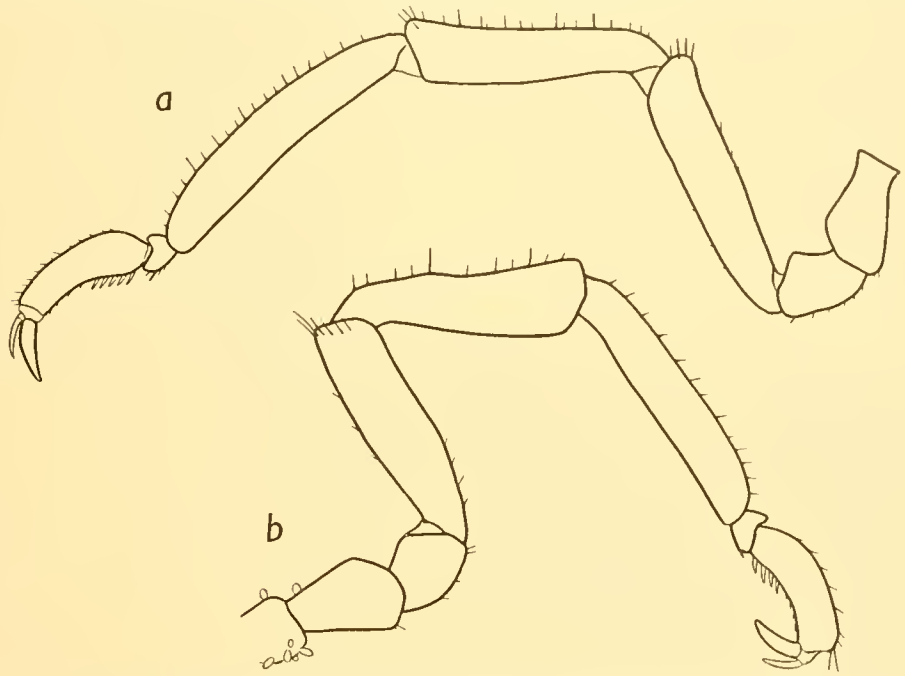

Fig. 68. *Tanystylum pfefferi*, Bouvier. Third leg of male: *a*. Typical—St. WS 25. *b*. St. WS 124; a number of small capsules (? encysted Protozoa) attached to first coxa.

segment is shorter, not equal to or longer, than the second segment (Fig. 66 *a*). (2) The walking leg is more robust and the propodus and tarsus are considerably longer relative to the second tibia $\left(\frac{\text{length of second tibia}}{\text{length of tarsus + propodus}} = \frac{1{\cdot}25}{1} \text{ instead of } \frac{1{\cdot}75\text{–}1{\cdot}9}{1}\right)$. The other differences are very slight. (3) The specimens are of much smaller size, yet many females and at least one male have genital apertures (see measurements). (4) There is usually a narrow conical process on the ocular tubercle above the level of the eyes. (5) There are as a rule no setae or tubercles on the lateral processes. (6) The abdomen is more oblique. (7) The chelophores are rather longer (Fig. 67 *a* and *b*).

The specimens from Gough Island (WS 124) are much more like the typical form. The abdomen is nearly vertical, the ocular tubercle and the chelophore are quite typical, and the walking leg, though somewhat more robust, has a long second tibia (Fig. 68 *b*: cf. Figs. 68 *a* and 67 *a*). There are one or even two small rounded tubercles

on each lateral process. The palp is again six-jointed, the terminal segment being equal to the second (Fig. 66 *b*). It is perhaps of interest to note that the egg mass in this instance is single and carried on both ovigers.

For the present it is advisable to refer all these forms to a single species because of the variation that occurs typically in the terminal segment (or segments) of the palp in *T. pfefferi*. The specimens from Gough Island and that from Tristan da Cunha, although found beyond the northernmost limits of the sub-Antarctic Zone, can hardly be distinguished from the South Georgian specimens—except as regards the egg mass and the palp. The specimens from the Magellan district include no ovigerous males, but the walking legs of some of the females contain developing ova, so that it is highly probable that adults do not exceed 1 mm. in trunk length. The smaller ratio between the lengths of the second tibia and tarsus plus propodus can hardly be regarded as of specific importance. Calman (1915, p. 59, figs. 13 and 14) found a similar type of variation in *Achelia spicata*, although in that case the specimens were (with two exceptions) from one locality. The numerous specimens from the hulk of the 'Great Britain' are a pure culture. In such a limited area close inbreeding doubtless occurs.

The breeding season appears to vary somewhat, males from the first two stations were carrying larvae in October and December; the single male from Gough Island was carrying eggs as early as July.

Measurements (*mm.*)

	♂ (St. WS 25)	♂ (St. 53)	♂ (St. 124)
Length of proboscis	1·2	0·55	0·82
Greatest width of proboscis ...	0·55	0·3	0·4
Length of trunk	1·65	0·8	1·1
Width across second lateral processes	1·75	0·9	1·1
Length of abdomen	0·7	0·33	0·4
Length of chelophore	0·2	0·13	0·13
Third leg:			
Coxae	1·6	0·7	0·95
Femur	1·8	0·73	1·0
First tibia	2·05	0·79	1·2
Second tibia	2·4	0·8	1·3
Tarsus and propodus	1·2	0·6	0·75
Claw	0·5	0·3	0·25
Auxiliaries	0·35	0·15	0·2

DISTRIBUTION. South Georgia, the Falkland Islands, Gough Island and Tristan da Cunha.

Genus **Rhynchothorax**, Costa

Rhynchothorax australis, Hodgson.

Hodgson, 1907, p. 57, pl. viii, fig. 3; 1915, p. 148.
Calman, 1915, p. 67, fig. 21.
Loman, 1923 *a*, p. 12.

St. WS 84. 24. iii. 27. 7½ miles S 9° W of Sea Lion Island, East Falkland Islands, from 52° 33′ S, 59° 08′ W to 52° 34′ 30″ S, 59° 11′ 00″ W, 75–74 m.; c. S. Sh. St. Commercial otter trawl: 1 immature specimen.

DISTRIBUTION. Ross Sea area and the Magellan district.

Genus Nymphopsis, Haswell

Nymphopsis denticulata, n.sp. (Figs. 69 and 70).

St. WS 85. 25. iii. 27. 8 miles S 66° E of Lively Island, East Falkland Islands, from 52° 09′ S, 58° 14′ W to 52° 08′ S, 58° 09′ W, 79 m.; S. Sh. Commercial otter trawl: 1 ♀.

Description. *Trunk* compact; lateral processes in contact, 1–3 each with an anterior and a posterior spinose process, 4 with an anterior one only (Fig. 69). Cephalic segment distinctly separated off by a suture from the succeeding segments, which are all completely fused. Two acute antero-lateral spinose processes on cephalon; ocular tubercle high, tubular, situated mid-way between these on the anterior border of cephalon. Eyes large, sub-terminal. Two high, slender, spinose projections on mid-dorsal surface, between cephalic suture and abdomen (Fig. 69).

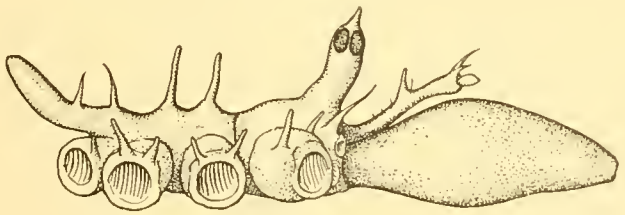

Fig. 69. *Nymphopsis denticulata*, n.sp. Holotype. Lateral view of body with chelophore: × 30.

Proboscis slightly longer than trunk, ovate, tapering anteriorly to a blunt point (Fig. 69).

Abdomen, long, slender, sub-cylindrical, elevated in distal half and reaching a little beyond the distal end of the second coxa; two small spinose projections on proximal half (Fig. 69).

Chelophore approximately half as long as proboscis. Scape of almost uniform diameter throughout and consisting of a single segment; a short, stout, spinose process on the mid-dorsal surface, a bifurcated process at the inner, and two smaller spines at the outer distal angle (Fig. 70 *a*, lateral aspect). Chela small and imperfect.

Palp as represented in Fig. 70 *b*, nine-jointed and longer than proboscis.

Oviger ten-jointed, with one or two denticulate spines on the four terminal segments as in some species of *Achelia* (Fig. 70 *c*: cf. Fig. 59 *a*, *c*); terminal claw absent.

Walking leg. The second walking leg, which was already detached from the specimen, is represented in Fig. 70 *d* and *e*; the spinose setae are simple, not compound and the auxiliary claws are at least two-thirds as long as the main claw. Ova are present in the two distal coxae and in the femur.

Measurements (*mm.*)

Length of proboscis	1·35	Second leg:	
Greatest width of proboscis	0·6	Coxae	1·2
Length of trunk	1·13	Femur	1·4
Length of cephalic segment	0·6	First tibia	1·4
Width of anterior border of cephalon	0·67	Second tibia	1·47
Width across first lateral processes	1·2	Tarsus and propodus	0·87
Length of abdomen	0·6	Claw	0·35
Length of chelophore	0·68	Auxiliaries	0·25

Remarks. This specimen differs from the four known species of the genus in having (1) the cephalic segment separated off from the remaining trunk segments, (2) simple instead of compound spines on the legs, (3) the scape of approximately uniform diameter throughout, and not hollowed out to form a cup or collar[1] around the proximal part of the chela, and (4) denticulate spines on the terminal segments of the oviger. These differences are not of generic importance.

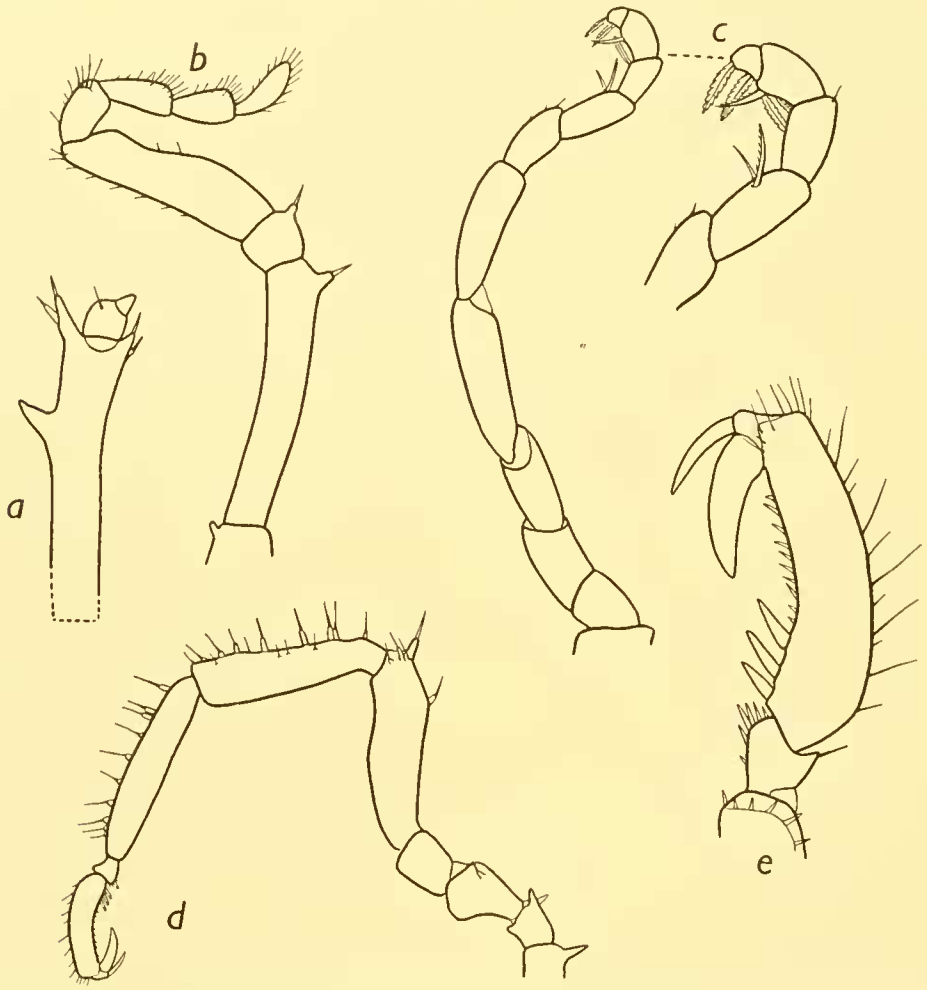

Fig. 70. *Nymphopsis denticulata*, n.sp. Holotype: *a*. Chelophore, lateral view. *b*. Palp. *c*. Oviger and terminal segments, further enlarged. *d*. Second left leg. *e*. Terminal segments of same, further enlarged. (*a*, *b*, *c* and *e*: × 60.)

In three species—*N. armatus*, Haswell (Flynn, 1919, p. 84, pl. xxi, fig. 18), *N. korotnewi*, Schimkewitsch, and *N. muscosus*, Loman (1908, pp. 50–53, pl. xiii, figs. 175–188)—the chelophore exceeds the proboscis in length. In the remaining two species—*N. abstrusus*, Loman, and *N. denticulata*—the chelophore is shorter than the proboscis. The former differs from the latter species, however, in having a two-jointed scape and three, instead of two, spinose projections on the dorsal surface of the trunk.

[1] *N. abstrusus*, Loman, also seems to have no projecting collar round the chela, but the figures given are very small (Loman, 1923 *a*, p. 8, fig. D 1 and 2).

Distribution. This is the first record of the genus from the western side of the sub-Antarctic Zone.

Family PYCNOGONIDAE

Genus Pycnogonum, Brünnich

Pycnogonum rhinoceros, Loman (Fig. 71 *c*).

Loman, 1923, p. 7, fig. A, 1–5.

St. 45. 6. iv. 26. 2·7 miles S 85° E of Jason Light, South Georgia, 238–270 m.; gy. M. Large otter trawl: 1 ♂.

Remarks. A single, large male undoubtedly belongs to this species. The type specimens were not quite adult and the oviger (Loman, 1923, fig. A, 3, p. 8) possessed

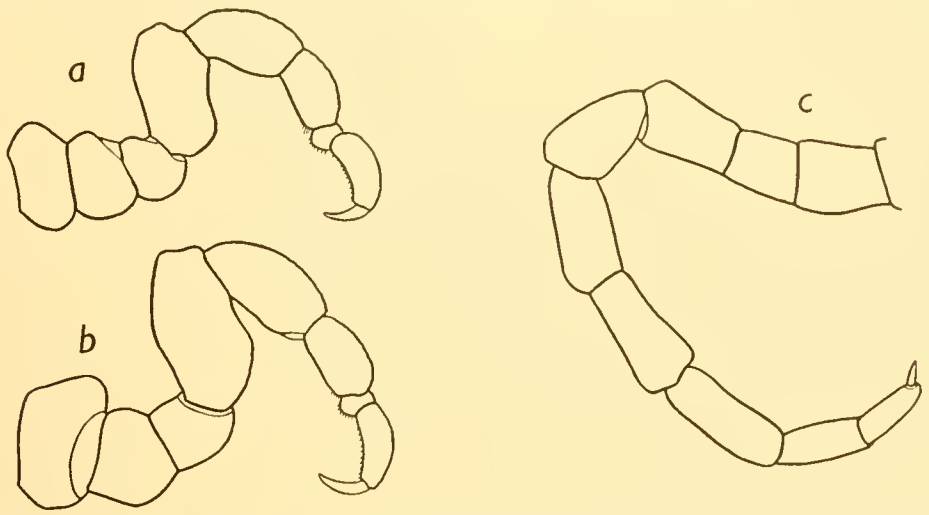

Fig. 71. *Pycnogonum platylophum*, Loman: *a*. Third leg of male. *b*. Same of female. (Both: × 20.)

P. rhinoceros, Loman: *c*. Oviger of male.

only seven segments. In the Discovery specimen the oviger is nine-jointed, with a short terminal claw (Fig. 71 *c*). Loman states that there is "no trace of eyes"; in the Discovery specimen, however, eyes are present and the anterior is larger than the posterior pair.

Measurements (*mm.*)

Length of proboscis	7·0	Third leg:	
Greatest width of proboscis	3·7	First coxa	1·6
Length of trunk	9·6	Second coxa	2·0
Length of cephalic segment	2·6	Third coxa	0·9
Width of cephalon	3·5	Femur	4·4
Width across second lateral processes	7·3	First tibia	4·8
Length of abdomen	2·4	Second tibia	4·0
		Tarsus and propodus	2·8
		Claw	1·0

Distribution. South Georgia.

Pycnogonum platylophum, Loman (Fig. 71 *a*, *b*).

Loman, 1923 *a*, p. 10, fig. E, 1–5.

St. WS 88. 6. iv. 27. 54° 00′ S, 64° 57′ 30″ W, 118 m.; S. Sh. St. Commercial otter trawl: 1 ♂.

St. WS 93. 9. iv. 27. 7 miles S 80° W of Beaver Island, West Falkland Islands, from 51° 51′ S, 61° 30′ W to 51° 54′ S, 61° 30′ W, 133–130 m.; gy. S. Commercial otter trawl: 1 ♀.

Measurements (*mm.*)

	♂	♀
Length of proboscis	2·0	3·0
Basal width of proboscis	1·17	1·6
Length of trunk	3·65	5·0
Length of cephalic segment	1·4	2·07
Width of cephalon (anterior border)	1·4	1·8
Width across second lateral processes	2·45	3·4
Length of abdomen	1·2	1·3

Remarks. These specimens differ from the holotype described by Loman (1923 *a*, p. 10, fig. E) in one minor point—namely, in having the lateral processes in contact instead of separated by narrow intervals. Fig. 71 *a* and *b* represents the third right leg of the male and of the female respectively. The female is rather soft and of a light brownish-yellow colour; the male is much darker brown in colour, with more slender walking legs. The genital pores are present in each specimen.

Distribution. Sub-Antarctic, from the Magellan district.

Pycnogonum magellanicum, ? Hoek (Fig. 72).

P. magellanicum, Hoek, 1898, p. 296, pl. iii, figs. 20 and 21.
? *P. magnirostre*, Möbius, 1902, p. 194, pl. xxx [vii], figs. 12–14.

St. WS 228. 30. vi. 28. 50° 50′ S, 56° 58′ W, 229–236 m. Commercial otter trawl: 1 ♂, 1 ♀.

St. 399. 18. v. 30. 1 mile SE of SW point of Gough Island, 141–102 m. Large dredge: 1 ♀, 1 ovigerous ♂.

Description of male (WS 228). *Trunk* compact, three distinct transverse body ridges present, each with a median, round, blunt tubercle; a similar tubercle on each lateral process. Lateral processes 2–4 each in contact with the preceding body ridge. Cephalic segment equal to the sum of the two succeeding segments; ocular tubercle situated on a broad slightly raised ring near the anterior border of cephalon and not quite as high as wide; eyes large. Width across first a little greater than that across second lateral processes.

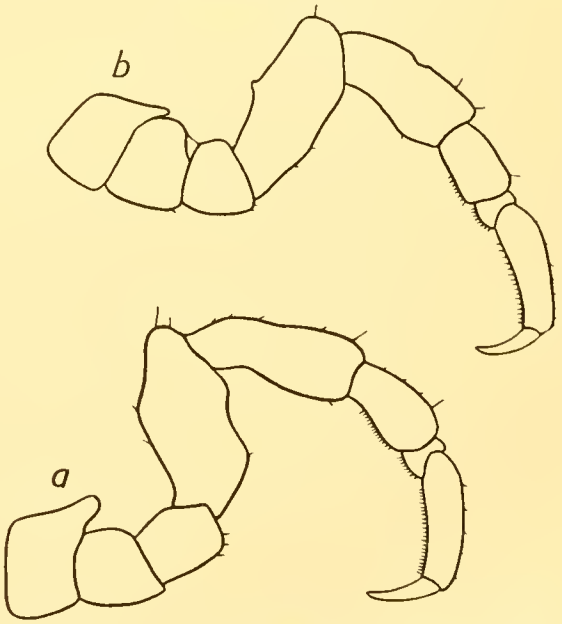

Fig. 72. *Pycnogonum magellanicum*?, Hoek: *a*. Third leg of male. *b*. Same of female—St. WS 228. (Both: × 20.)

Proboscis a little shorter than cephalic segment, bluntly conical.

Abdomen somewhat clavate, reaching to distal end of second coxa of fourth leg.

Oviger short, with nine small segments and a terminal claw. The left oviger has been entirely suppressed and there is no trace of the small process to which it ought to be attached.

First coxae at least twice as wide as long, the anterior distal angle of each is drawn out into a triangular lobe.

Third leg as represented in Fig. 72 *a* and at least half as long again as the trunk.

Female. The transverse body ridges and the anterior rim of the cephalon are more pronounced than in the male. There are two small pointed tubercles a short distance behind the ocular tubercle—these are much smaller in the male. The ovigers are, of course, wanting, and there is a low, round tubercle dorsally on the second coxa of the last leg.

The genital openings are apparently not yet present in the female, but they are quite distinct in the male.

Measurements (mm.)

	Holotype	St. WS 228		St. 399	
	♀	♂	♀	♂ (ovig.)	♀
Length of proboscis	3·2	1·2	1·2	0·93	1·1
Basal width of proboscis	1·8	0·9	0·9	0·67	0·9
Length of trunk	5·73	3·7	3·8	2·5	3·5
Length of cephalic segment	2·2	1·6	1·4	1·0	1·3
Width of anterior border of cephalon	2·0	1·3	1·35	0·87	1·2
Width across second lateral processes	4·0	2·45	2·6	1·45	2·0
Length of abdomen	1·4	1·2	0·95	0·53	0·6
Third leg:					
Coxae	1·8	1·0	1·1	0·6	0·73
Femur	1·7	1·3	1·1	0·5	0·63
First tibia	1·6	1·3	1·1	0·5	0·6
Second tibia	1·0	0·7	0·55	0·35	0·4
Tarsus and propodus	—	1·07	1·05	0·5	0·55
Claw	—	0·5	0·5	0·25	0·24
L. of trunk ÷ w. across 2nd lateral processes	1·43	1·51	1·46	1·72	1·75
L. of abdomen ÷ l. of trunk	0·24	0·32	0·25	0·21	0·17
L. of third leg ÷ l. of trunk	—	1·59	1·42	1·04	0·9

Remarks. The specimens from St. 399 differ from those just described in the following respects. (1) The trunk is narrower, with lower transverse body ridges and lower median tubercles. (2) The third leg is subequal to, instead of approximately half as long again as the trunk length. (3) The abdomen also is shorter, although it again reaches to the distal end of the second coxa (see ratios above). (4) The lateral processes are separated by narrow intervals. The genital openings are quite distinct in each specimen.

The Discovery specimens are referred provisionally to *P. magellanicum*, although they do not agree with each other or with the holotype. Hoek's figure (1898, pl. iii, fig. 20) does not show the transverse body ridges nor the low median tubercles of the holotype, which in this respect agrees with the specimens from St. 399. In other respects the

holotype agrees more closely with the specimens from WS 228, e.g., as regards width of trunk and length of abdomen (see ratios above). The third leg is incomplete; but the sum of the segments measured exceeds the trunk length, so that the complete leg would probably be about half as long again as the trunk.

The holotype has a much longer proboscis than any of the Discovery specimens, being almost as long as the sum of the first two segments. *P. magnirostre*, Möbius (1902, p. 194, pl. xxx, figs. 12–14), from Kerguelen also has a very long proboscis and may prove to be identical with *P. magellanicum*. It is possible that more than one species of *Pycnogonum* is represented, but the five specimens measured above are not sufficient to enable one to settle this point satisfactorily.

Distribution. Off the Falkland Islands and Gough Island.

THE CENTRAL NERVOUS SYSTEM IN DECOLOPODA

The nervous system is very similar to that described for *Colossendeis* by Hoek (1881, pp. 108–119, pl. xvii, fig. 2 and pl. xviii, fig. 4). The long circum-oesophageal commissures, considerably foreshortened in Fig. 73 A, enclose the oesophagus and a pair of somewhat triangular muscles that work the proboscis.

The usual main nerves arise from the supra-oesophageal ganglia, namely: *a*, a median azygous proboscidial nerve; *b*, a pair of optic nerves each dividing into three branches to innervate the anterior eye, the "sense organ"[1] and the posterior eye respectively (see Fig. 73 C), and *c*, a pair of nerves to the chelophores. A pair of fine nerves, *d*, probably correspond to those designated by Wirén (1918, pp. 73 and 79, figs. 10, 14 and 15) as nerves No. 3 in *Nymphon grossipes-mixtum*[2]. But, instead of pursuing a course parallel to the azygous proboscidial nerve, as in *Nymphon*, they pass obliquely outward and forward towards the base of the chelophores, innervating the muscles that work these appendages. Near to these latter nerves, a pair of thin strands arise (*e*) and run directly forwards to break up into a meshwork innervating the skin along the anterior border of the cephalon. In *D. antarctica* this pair of nerves is well seen (Fig. 73 B, *e*), but in the dissections of *D. australis* they were, as a rule, removed with the skin. *D. antarctica* differs from *D. australis* in two respects: (1) the optic nerve is much stouter, with shorter thicker branches; (2) nerve *d* arises from the optic nerve. In the specimen from which Fig. 73 B was obtained, nerve *d* arose from the base of the median branch of the optic nerve on the left side, as represented in the diagram, whereas on the right side it arose from the main stalk of the optic nerve just below the forking.

From the first thoracic ganglionic mass three pairs of nerves arise (Fig. 73 A, 1, 2, 3) innervating the proboscis, palps and ovigers respectively. In *D. antarctica* from St. 42 the proboscidial nerves arise each from the circum-oesophageal commissure a short distance from the thoracic ganglionic mass; in the male from St. 149 the nerve on the

[1] Probably a vestigial eye (see Loman, 1924, p. 318).

[2] Only present in *Nymphon* (Wirén, 1918, pp. 73 and 77).

left arises similarly from the commissure, while that on the right arises from the ganglionic mass (as in *D. australis*, Fig. 73 A).

Wirén (1918, p. 80, fig. 16) illustrates a nerve, designated as No. 5, arising from near

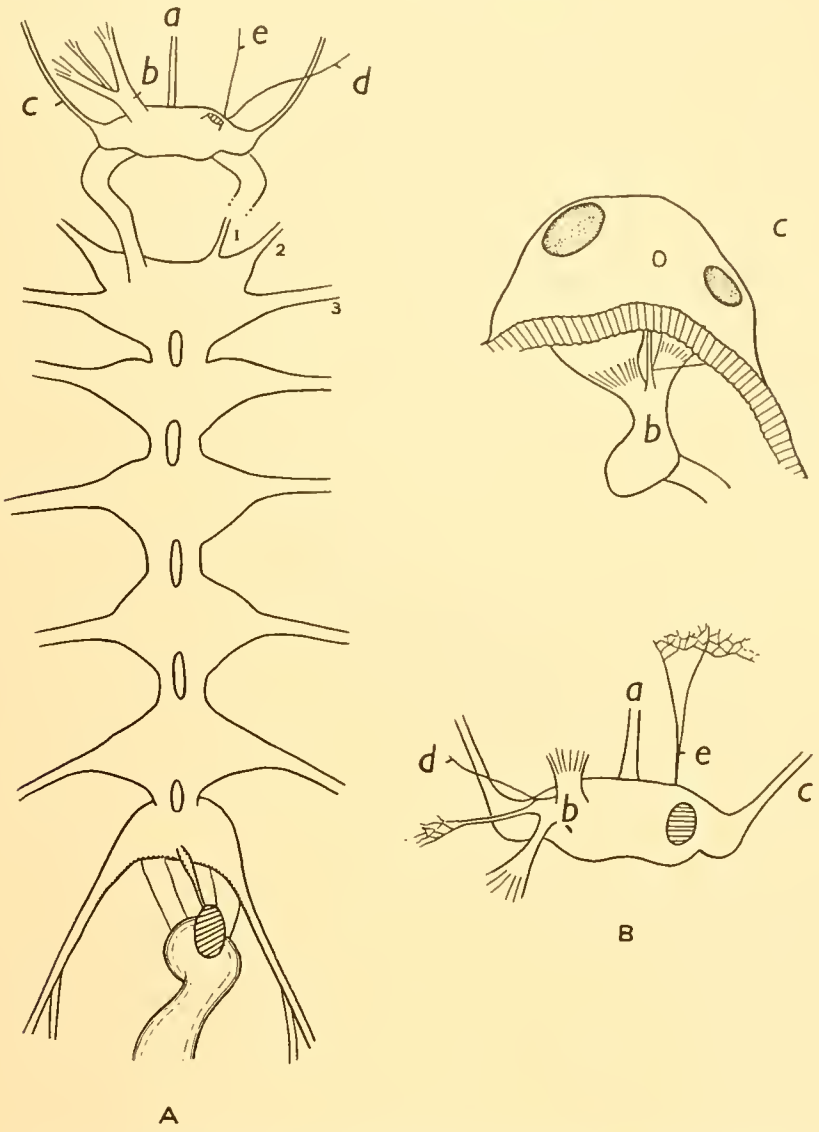

Fig. 73. *Decolopoda australis*, Eights: A. Central nervous system: × 13. *Decolopoda antarctica*, Bouvier. B. Supra-oesophageal ganglia and their associated nerves (diagram). C. Optic nerve and its branches below the ocular tubercle: × 13

a. Median azygous proboscidial nerve. *b*. Optic nerve. *c*. Nerve to chelophore. *d*. Nerve to muscle working chelophore. *e*. Superficial nerve to anterior border of cephalon. 1, 2 and 3. Nerves to proboscis, palp and oviger respectively.

the base of the circum-oesophageal commissure in *Colossendeis*; this nerve (1918, pp. 73–4) passes right forward to the base of the proboscis, near to the point of insertion of the palp, to innervate muscles. In *D. antarctica* I have been unable to discover this

nerve, neither was it observed in the specimen of *D. australis* from St. 149 represented in Fig. 73 A; but a very slender nerve strand was present in one of the specimens from St. 154.

As anticipated, the ventral nerve chain in *Decolopoda* possesses six, instead of the usual five, ganglionic masses. The lateral nerves to palp, ovigers and each leg soon bifurcate.

ABNORMALITIES

Abnormalities occur very infrequently in Pycnogonida; at any rate, in the large Discovery collection the following few examples are all that were noted,[1] apart from the occasional loss and subsequent regeneration of a walking leg.

1. *Palp.* The tip of the palp is sometimes slightly abnormal, e.g. (i), the right palp of *Colossendeis tortipalpis*, n.sp., represented in Fig. 2 *e*; (ii), the left palp of *Ammothea*, sp.? described on p. 108 and (iii), the right palp of the holotype of *Ammothea calmani*, n.sp. (Fig. 74 *a*), where segments 7 and 8 appear to be fused. In the last example the notch *x* (Fig. 74 *a*) may represent the beginning of bifurcation or of segmentation.

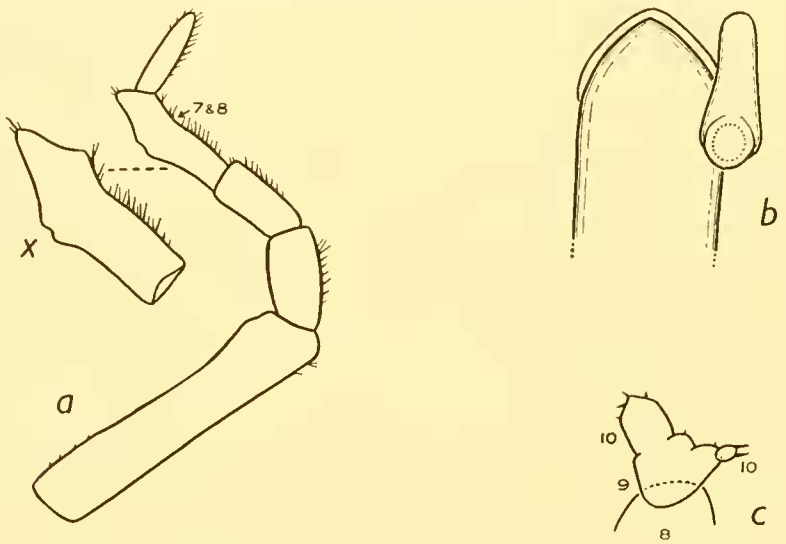

Fig. 74. *a. Ammothea calmani*, n.sp. Holotype. Segments 4–9 of right palp—segments 7 and 8 are apparently fused: × 15 and 20.

b. Decolopoda antarctica, Bouvier. Proximal portion of abdomen, showing additional small clavate process on right side: × 20.

c. ?*Paltenopsis* sp. St. 256. Terminal segments of oviger showing distinct bifurcation: × 100.

The most extreme case of abnormality is the tripartite palp of *Nymphon proceroides*, Bouvier (Fig. 75). Here *a* is probably the original left palp, bearing the two extra palps on the outer distal angle of the second segment. The long axes of palps *a*, *b* and *c* lie in one plane; *b* is a mirror image of *a* and *c* of *b*, according to the two rules enunciated by Bateson (1894, p. 479).

[1] Two of the abnormalities figured (Figs. 74 *a*, 75) occurred in specimens from other collections.

These variations are sporadic and may be the result of some slight injury; in one species, however, slight palpal abnormalities occur so frequently as to be characteristic of the species. In *Decolopoda antarctica*, Bouvier (fig. 1, *a–e*), the number of palpal segments varies from 8 to 10 (Table I). Until a large number of specimens are available for study it is impossible to say whether eight or nine is the normal number of segments. Three of the seven specimens examined have both palps eight-jointed as in Fig. 1 *a*; one specimen has both palps nine-jointed. The numbers of palpal segments in each of the seven specimens may be represented as follows: 8, 8; 8, 8; 8, 8; 9, 9; 8, 9; 8 + (fig. 1 *d*), 8; 8 + (fig. 1 *c*), 9 + (fig. 1 *e*). The vestigial ninth or tenth segment (Figs. 1 *d* and 1 *e*) may resemble a minute claw. Calman (1920, p. 244) puts forward the view that "the assumption of a claw-like form by the terminal segment may, perhaps, be regarded as a case of homœosis" since all appendages posterior to the palp may end in claws. Occasionally the terminal segment is somewhat abnormal, as in Fig. 1 *b*, suggesting regeneration of the apex after mutilation. Judging from the abundance of encrusting organisms found on *Decolopoda antarctica*, it must be a very sluggish species (see p. 132), and thus it may be unusually liable to have the palp nibbled by an Isopod or some such animal.

2. *Oviger.* In one instance—*Pallenopsis* sp.?, St. 256—the tip of the oviger has bifurcated (Fig. 74 *c*); in fact segment 9 has almost the appearance of trifurcating.

Quite a different type of abnormality occurred in a male of *Pycnogonum magellanicum*? (WS 228), where the left oviger was entirely suppressed, that on the right side being present.

3. *Ocular tubercle.* A specimen of *Austrodecus glaciale*, Hodgson, had had the greater part of the ocular tubercle removed as the result of some accident. The wound had healed over without any apparent attempt at regeneration. The long ocular tubercle is so conspicuous a feature of this species that the low blunt stump attracted attention at once. Perhaps, had the animal undergone another moult, the deficiency might have been made good. But there is no experimental evidence on this point.

4. *Abdomen.* It is interesting to find, in a species showing frequent variation in the distal segmentation of the palp, the following peculiarity. In the specimen of *Decolopoda antarctica* from St. 164 there is, to the right of the abdomen, a short, ? movable, clavate process projecting from the posterior end of the trunk (Fig. 74 *b*). A small circular area at the posterior end is thin and membranous, but it is rather difficult to decide whether it is perforate. Unfortunately the process was detached from the specimen after the camera lucida drawing had been made; only a very small indication of the point of attachment can now be observed. This process may be interpreted as an abortive second abdomen.

5. *Auxiliary claw.* The third right leg of *Pentanymphon antarcticum*?, Hodgson, from St. 170, has two auxiliary claws on the anterior side, and only one, as is usual, on the posterior side of the main claw. There is no reversal of symmetry here and no

indication of a median reversed claw between these two auxiliaries. The outer, or dorsal, is probably the original auxiliary, since it is on a level with and subequal to the auxiliary on the posterior side. The inner, additional auxiliary is very small.

6. The female of *Nymphon tenuipes*, Bouvier (p. 38), is interesting in that the two anterior pairs of walking legs are shorter and much more slender than the two posterior pairs and do not contain developing ova. It is possible that all four anterior legs were lost and subsequently regenerated, although the loss of so many legs at one and the same time would be a rare occurrence. It is just possible, of course, that the original specimen was cut in two halves and that the whole anterior portion of the body was regenerated. This is highly improbable, however, for Loeb (1895, p. 251), experimenting with *Phoxichilidium maxillara*, found that "Bei den aboralen Hälften konnte ich dagegen nur eine Anschwellung am vorderen Ende wahrnehmen". The trunk, chelophores, palps and ovigers are all apparently quite normal and show the normal relative proportions; if the whole anterior half of the body had been regenerated it would very likely have been small in proportion to the posterior half. Another possible explanation may be advanced tentatively, namely, that in this species the female has normally only two pairs of genital openings as in the male; but until more females are available the specimen may be regarded as somewhat abnormal.

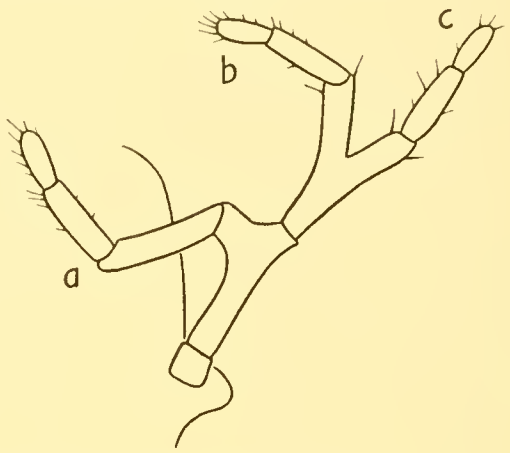

Fig. 75. *Nymphon proceroides*, Bouvier. Co-type. Ventral view of left palp.

ENCRUSTING ORGANISMS

Encrusting organisms are found on Pycnogonida with far greater frequency than on Crustacea, for example. These are chiefly encrusting Polyzoa, adherent Foraminifera and Hydroids; but, in addition, an occasional Brachiopod, Sponge, Tunicate, Serpulid and Cirripede (*Scalpellum*) may be attached. Occasionally, also, one or two Isopods may be found clinging to a Pycnogonid.

From the abundance of encrusting Polyzoa found on *Decolopoda antarctica*, compared to those on *D. australis*, it is evident that the former must be a more sluggish species than the latter (see list below). Polyzoa are also found growing on five species of *Ammothea*—e.g. the specimen of *A. striata* from St. 167 has very large patches of *Alcyonidium* entirely covering a number of the long segments of the legs. Perhaps these species are also rather sluggish, but the numbers of individual specimens are too small to enable one to be at all dogmatic on this point. With the exception of *Colossendeis glacialis*, the remaining species on the list are each represented by a large number of

specimens; one would therefore expect to find a certain number of Polyzoa on at least some of the specimens in each case.

The Polyzoa and Tunicata listed below have been determined by Dr Anna B. Hastings of the British Museum (Natural History).

POLYZOA

Schizoporella hyalina var. *discreta* (Busk)	on	*Decolopoda antarctica*	St. 140
Crisia sp. *Membranipora galeata*, Busk **Schizoporella hyalina* (Linn.) var.? *Osthimosia* sp.	on	*Decolopoda antarctica*	St. 123
Figularia sp. *Schizoporella hyalina* (Linn.) var. ?	on	*Decolopoda antarctica*	St. 39
Figularia sp. *Schizoporella hyalina* (Linn.) var. ?	on	*Decolopoda antarctica*	St. 149
Schizoporella hyalina var. *discreta* (Busk)	on	*Decolopoda antarctica*	St. 164
Schizoporella hyalina var. *discreta* (Busk)	on	*Decolopoda australis*	St. 154
Schizoporella hyalina (Linn.) var. ?	on	*Colossendeis glacialis*	Sts. 155 and 148
Schizoporella hyalina var. *discreta* (Busk)	on	*Colossendeis glacialis*	St. 149
Osthimosia sp. *Membranipora galeata*, Busk *Alcyonidium* sp. *Barentsia discreta* (Busk)	on	*Nymphon charcoti*	St. 39
Membranipora galeata, Busk *Schizoporella hyalina* (Linn.) var. ?	on	*Nymphon charcoti*	St. MS 68
Schizoporella hyalina (Linn.) var. ?	on	*Nymphon charcoti*	St. 195
Cellaria sp. *Schizoporella hyalina* (Linn.) var. ? *Osthimosia* sp.	on	*Nymphon australe*	St. 45
Osthimosia sp.	on	*Nymphon australe*	St. 182
Supercytis sp. *Schizoporella hyalina* (Linn.) var. ?	on	*Nymphon australe*	St. 42
Osthimosia sp.	on	*Pallenopsis patagonicum*	St. 84
Schizoporella hyalina (Linn.) var.	on	*Pallenopsis patagonicum*	St. 167
Tubulipora sp. *Amastigia nuda*, Busk	on	*Pallenopsis patagonicum*	St. WS 84
Crisia sp. *Schizoporella hyalina* (Linn.) var.	on	*Ammothea gigantea*, n.sp.	St. 371
Schizoporella hyalina var. *discreta* (Busk)	on	*Ammothea carolinensis*	Cumberland Bay
Schizoporella hyalina (Linn.) var. ?	on	*Ammothea minor*	Sappho Point and St. 371
Schizoporella hyalina var.	on	*Ammothea minor*	St. 190
Schizoporella hyalina var. *Alcyonidium* sp. *Osthimosia* sp.	on	*Ammothea striata*	St. 167
Schizoporella hyalina var.	on	Holotype of *Ammothea stylirostris*, n.sp.	St. 39

TUNICATA

The Tunicates on *Nymphon charcoti*, St. MS 68, *N. hiemale*, St. 39, and *Ammothea gigantea*, St. 371 all belong to the family Polycitoridae (Distomidae).

* *Schizoporella hyalina* var.? is very near the typical British form. By *Schizoporella hyalina* var. (unqueried) I have indicated a distinct variety for which, at present, I have not found a name. [A. B. H.]

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[Synonyms are indicated by italics. References to specific descriptions are in heavy type.]